THE DAWN OF MEDITERRANEAN CIVILIZATION

ANGELO MOSSO

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Richard Cornthwaite Lambert.

THE DAWN OF MEDITERRANEAN CIVILISATION

THE PALACES OF CRETE
AND THEIR BUILDERS

By Angelo Mosso. With 187 Illustrations and 2 Plans. Royal 8vo, cloth, 21*s*.

A graphic account of the results of the excavations in Crete by the British and Italian Schools of Archæology. The author reviews in succession the buildings, sculpture, frescoes, and vase-paintings, and the religion of the Minoan and Mycenæan periods.

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FROM THE PAINTED SARCOPHAGUS OF HAGHIA TRIADA.

(Fig. 110.)

THE DAWN OF MEDITERRANEAN CIVILISATION

BY

ANGELO MOSSO

AUTHOR OF "THE PALACES OF CRETE AND THEIR BUILDERS,"
"THE LIFE OF MAN ON THE HIGH ALPS," ETC.

WITH TWO HUNDRED AND THREE ILLUSTRATIONS

TRANSLATED BY MARIAN C. HARRISON

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To

FEDERICO HALBHERR

PROFESSOR AT THE UNIVERSITY OF ROME

LEADER OF THE ITALIAN ARCHÆOLOGICAL

EXPLORATION OF CRETE AND

DISCOVERER OF THE

INSCRIPTION OF THE LAWS OF GORTYNA

THIS BOOK IS DEDICATED

WITH THE

ADMIRATION OF A DISCIPLE

AND THE

AFFECTION OF A FRIEND

PREFACE

THE favourable reception by the public of my first essays on the excavations in Crete has encouraged me to write a second volume treating more fully of the evidences of ancient Cretan civilisation as now known to us. The material which I collected in Crete, and especially the results of my excavations at Phæstos, could not all be included in my former volume, and I have during the last three years excavated much in Sicily and Southern Italy, and intend to continue this work next year in Upper Italy. The monuments which have already come to light are of such importance that I propose to write a third volume on the Italians from the stone age to the first Hellenic colonies.

In order to avoid the dryness of a purely technical work, and to make this volume more interesting to the general reader, I have kept the chapters in the form of essays, in which are related the things seen and lived through; and I hope that sufficient local colour is retained to enable the reader to follow the traces of the expeditions made and to participate in the feelings of one who leaves the old road of written history and makes his way through the ruins of the monuments up the stream of real history, unmodified by legend and illuminated only by the new light shining from the excavations.

I have devoted myself with enthusiasm to research in primitive religion and art, and have sought to trace out the

origins of trade and navigation in the Mediterranean; and if I have digressed too much in my attempts to make known by means of comparison the civilisation and private life of the inhabitants of this Continent in prehistoric times, I ask the indulgence of the reader, for I am convinced that it is worth while to excite the curiosity of those who are not archæologists, and I hope that my work in popularising archæology by my accounts of the prehistory of Crete and Egypt, and of other countries on the Mediterranean, may be of use towards the progress of culture and serious study.

A. M.

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The Dawn of Mediterranean Civilisation

CHAPTER I

THE FASCINATION OF PREHISTORY

I. THE TWO NEW PERIODS RECENTLY ADDED TO THE HISTORY OF MEDITERRANEAN CIVILISATION

WHEN I was a student, the history of Mediterranean civilisation began with Homer and the Bible. Since then two great periods have been added, each of them as long as the period for which we have written records. When Schliemann, in 1870, believed that he had found the ruins of Troy upon the hill of Hissarlik in Asia Minor, a new epoch began in the study of history. We know that only the latest strata show any resemblance to the civilisation described by Homer, and that six lower strata represent the detritus left by the earlier populations who had lived upon that hill. After this came the discoveries of Tiryns and Mycenæ, also by Dr. Schliemann, and finally, the excavations in Crete opened new horizons in the civilisation of the countries of the Mediterranean before Homer. I attempted in an earlier volume to give a popular account of the grandiose civilisation of Crete, and will now try to give an account of the prehistoric period of the neolithic age, as to which much information has been collected during the last fifty years.

A uniform culture existed in the whole basin of the Mediterranean, and lasted several thousand years. The beautiful pottery found by Paolo Orsi at Stentinella and Matrensa in Sicily belongs to this period, and that which I excavated and studied at the Pulo, near Molfetta, is identical with the predynastic pottery of Egypt. The characteristic decoration of the vases of the first Siculan period, described by Professor Orsi, is found in the neolithic soil of Crete and in other Greek lands, and the neolithic idols spread both from the islands of the Aegean and from the banks of the Nile over the whole continent of Europe.

The excavations in Crete have added a splendid preface to the history of the Mediterranean ; and the darkness of the past being dispelled, the duration of human life suddenly appears to us longer and the ascent more difficult.

Prehistory is the science which shows us best the connection between natural science and philosophic and moral science. The great progress made by Archæology in the last fifty years shows that even history, which seemed the most rigid and unchangeable of sciences, is following the example of all the other branches of experimental science, in that it has become young again and is sending forth new shoots into hitherto unexplored regions, and studying the first stages of man's advance from a state of savagery to civilisation. While history was formerly almost entirely based on books and the study of documents, its methods are now completely changed, and by means of excavations it has become allied to the natural sciences, intent on the collection of new facts and the bringing to perfection of its methods of investigation.

2. TOMBS OF THE NEOLITHIC PERIOD

Professor Maspero's history of the peoples of the Classical East,[1] which began with the Pharaohs who built the Pyramids, has been completed within the last few years by the prehistoric period. I shall begin with the prehistoric period, not for the

[1] G. Maspero, *Histoire Ancienne des peuples de l'Orient Classique.*

sake of conformity with the scholastic tradition which, when the story of the human race is to be told, places Egypt at the head of the nations, but because archæologists from every country have flocked to the valley of the Nile, and vaster means have there given impulse to new discoveries. By way of example I will point out what the Americans have lately done.

Mr. Hearst, in order to provide the University of California with an Egyptian museum, offered to pay the expenses for six years of an expedition which was to carry on the work of excavation in Egypt. Mr. Reisner was at the head of this expedition, and with him worked Miss Quibell and three other archæologists. They began to excavate in 1899, and the first volume on the early dynastic cemeteries [1] has been already published. Mr. Reisner examined twelve thousand tombs, and through his excavations we have obtained a knowledge of a period of a thousand years before the IInd Dynasty.

One fact of capital importance for prehistory is that in the valley of the Nile, as M. de Morgan [2] observed first, his view being confirmed by Dr. Petrie,[3] the bodies are buried in a contracted position.[4]

In 1826, the discovery of fifteen tombs near Lausanne drew the attention of archæologists to this arrangement of the bodies in a restricted space, the legs doubled up against the abdomen and thorax, the arms close to the body, and the hands near the chin. Later on, other graves were found in Savoy ; and in time, as excavation was extended, similar tombs came to light in all parts of Europe—beneath the hut floors of Reggiano, in the caves of Liguria,[5] and at Taranto.[6]

[1] G. Reisner, *The Early Dynastic Cemeteries of Naqa-Ed-Dêr.*

[2] De Morgan, *Recherches sur les Origines de l'Egypte*, 1887, p. 228.

[3] Flinders Petrie and J. E. Quibell, *Naqada and Ballas*, London, 1896.

[4] The recent excavations of Weigall in Nubia have widened the field of research in the neolithic age, which extends in the direction of the Soudan from the first cataract (*A Report on the Antiquities of Lower Nubia*, Department of Antiquities, Oxford, 1907).

[5] Issel, *Memorie Accad. dei Lincei*, 1878, p. 61.

[6] Quagliati, *Bullett. paletn. ital.*, xxxii. 1906, p. 17.

This custom of burying the bodies in a contracted position lasted till the age of iron. According to Herodotus the custom of burying the corpse in a sitting position still persisted in Tripoli [1] in his time.

In archæology, as in experimental science, much time is expended in searching for suitable ground for research, and in the control of possible errors. I experienced this during the brief period of my life devoted to archæology. Dr. Mayer had carried on some excavations in the vicinity of the Pulo, near Molfetta, and with the help of the Provincial Archæological Commission of Bari published a splendid volume. He had not, however, discovered the tombs, but only excavated a few which were scattered in a field, and was uncertain whether these tombs really belonged to the neolithic age.

This branch of study attracted me strongly, and as the neolithic graves were little known in Italy, I went to the Pulo in 1908 in order to search for the necropolis. Guided by the trenches cut by Dr. Mayer, I made test excavations on the periphery, and found hut foundations, stone weapons, and neolithic vases, but no tombs.

As the people who had lived by the Pulo had left evident traces of their habitation over a considerable extent of ground, I was convinced that the necropolis of this large neolithic village must exist, and returned there in 1909 to continue my search. I began to excavate in the fields on the side opposite to that where I had worked in the preceding year, and made two trial cuttings, each 50 metres long, but without finding anything. Continuing the excavations farther to the south, I at last discovered the necropolis, and forty-nine graves of the neolithic type have already come to light. The skeletons are in a contracted position, with stone weapons in their hands, and vases near them. These tombs are exactly like those found in Egypt, from the Delta of the Nile as far as Nubia. In nine only were the skeletons intact, the other graves had been opened in the course of agricultural work or by treasure-seekers, and contained only fragments of vases, stone knives, and human bones. Fig. 1 shows an empty

[1] *Hist.*, iv.

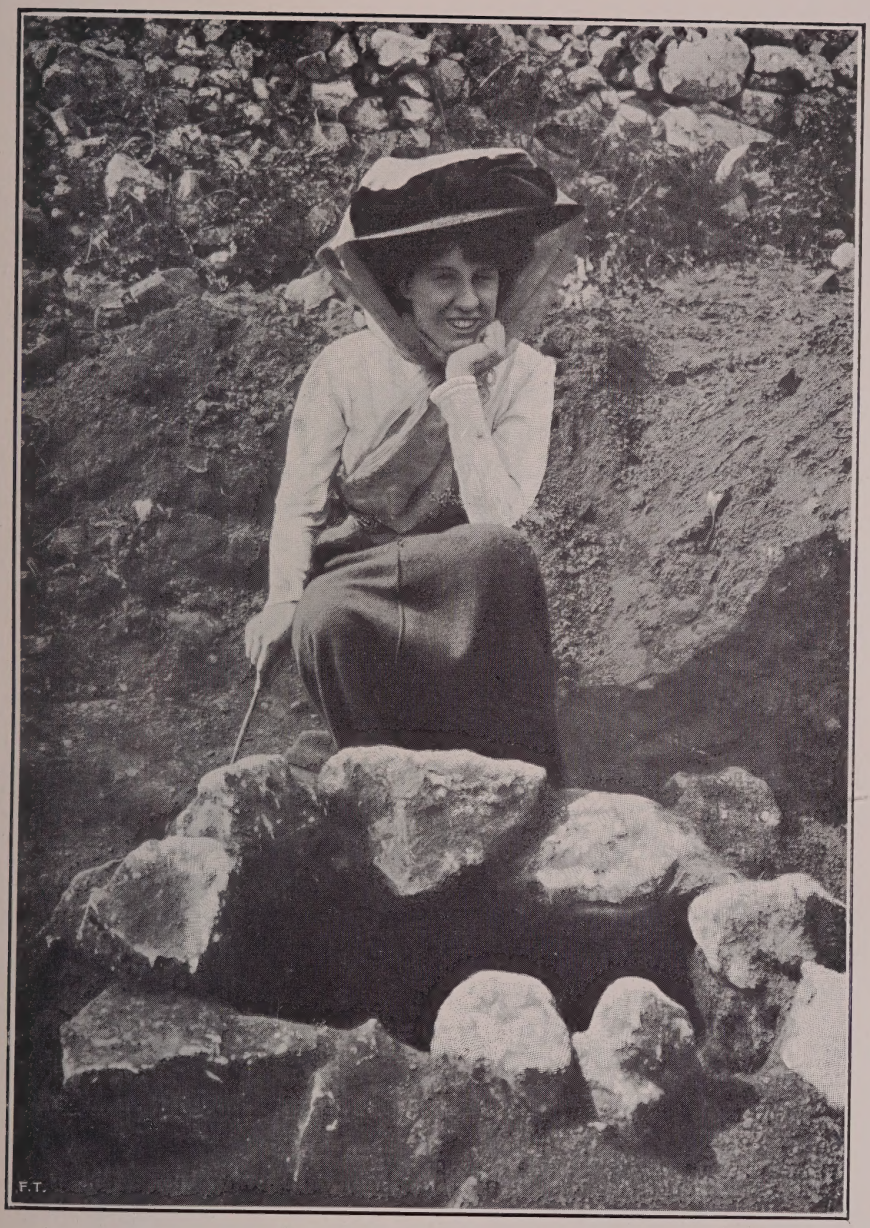


FIG. I.—TOMB IN THE NEOLITHIC CEMETERY, THE PULO, NEAR MOLFETTA.

grave, with the portrait of my daughter, who accompanied me on this expedition.

3. MIGRATIONS

M. G. de Mortillet,[1] one of the founders of the science of palo-ethnology, admits two immigrations from the East—one bringing neolithic civilisation, the other the use of metals. Though this is one of the most disputed questions in prehistory, I call the reader's attention to it at once, to enable him to form his own opinion on the facts which I record, a final judgment being as yet impossible.

The cause of this uncertainty is connected with a much more serious lacuna, which includes the palæolithic period—the longest period of prehistory. We are, unfortunately, still ignorant of the origin of man, and many years—perhaps centuries—of assiduous and fortunate work are needed before geologists and students of palæontology and archæology can give us a satisfactory picture of primitive man before the invention of pottery.

This year (1909) I visited the caves and foundations of the huts where the men of the palæolithic age lived on the eastern slopes of the Gran Sasso d'Italia, in the Valle della Vibrata, and on the promontory of Monte Gargano. In this part of Italy we find abundance of large, roughly chipped flint weapons, which are identical with those found first in France, then in Belgium, in England, and all over Europe, and divided by M. de Mortillet into three great periods[2] for the times preceding the neolithic age, of which I treat in the present volume. It is now known that the same palæolithic weapons are found in Egypt, and that the strata of prehistoric generations[3] lie superposed in the same order in the valley of the Nile as in Europe.

It is difficult to explain by the theory of migrations the fact that man, while still ignorant of pottery and possessing only

[1] G. de Mortillet, *Formation de la Nation Française*, p. 316.
[2] G. A. de Mortillet, *Le Préhistorique, Antiquité de l'homme*, 1900.
[3] Sophus Müller, *Urgeschichte Europas*, p. 18.

simple weapons of chipped flint, should have wandered through the whole of Egypt, along the shores of the Mediterranean, and have penetrated as far as Northern Europe ; nor is it any easier to suppose successive immigrations across such vast areas of land, of other peoples bringing polished weapons and pottery, copper and bronze. In our ignorance of where to fix on the centres of radiation, the principle of evolution is gaining ground, and some of the opponents of the ancient theory of migrations, such as Salomon Reinach,[1] disallow the theory according to which the primitive peoples came from Asia, because it seems contrary to human nature that they should, at a time when the population was by no means dense, abandon their fertile and smiling country to establish themselves in the cold forests of the inhospitable district of Central Europe. Whence came the people who taught the art of baking clay pots, of cleaning and polishing the hardest stone for the fabrication of weapons and domestic implements we know not.

The description which I will give of the neolithic soil of Crete will prove how long was the neolithic period. The men who occupied the hill of Knossos brought with them good but undecorated pottery ; the vases were smooth, and by degrees a design in incised lines was applied to them. Later on, these lines were filled with a white substance to give more relief to the design, and finally the vases were decorated with colour. Now appear the first objects of copper, then those of bronze ; all this by insensible gradations, without any sudden interruption in the development of the pottery to indicate the arrival of a conquering people. It is simply a local development such as goes on now in all inventions which are passed on from one country to another. This is, in my opinion, the most important point in the Cretan excavations, and I therefore describe them somewhat fully ; some pages on this subject may seem dry and monotonous, but are in fact full of instruction, because they act as a break in judging of the theory of invasions, and teach us to attach greater importance than we do to the evolution of the peoples and the

[1] Salomon Reinach, *L'Anthrop.*, xiv. 1903, p. 66.

influence of commerce. We cannot, of course, deny the fact that there were migrations, but the modern tendency of prehistory is to reduce as far as possible their number.

The progress of archæology in the last fifty years has been so great, has widened to so unexpected an extent the horizon of prehistory, that we have to consider the possibility of surprises, of sudden innovations, and our absolute ignorance of the earliest origin of human civilisation, rather than actual new discoveries. There is in this continual self-renewal of science a poetic fascination which makes us humble in the presence of the prodigious development of the knowable.

True scientific intuition, the fundamental conception of every science, consists in the sincere appreciation of the past, in carrying over all that has been discovered by experience to all that may be conquered in the future.

4. SYNTHETIC CONSIDERATIONS ON THE PREHISTORIC DISCOVERIES NOTED IN THE PRESENT VOLUME

I am attempting a series of rough sketches from life, but notice only those things which I have seen or discovered in connection with the origins of Mediterranean civilisation. The discoveries of others I use as a frame to set off the humble sketches representing the surroundings in which primordial civilisation was developed. The documents which came to light in the last excavations permit us to begin the study of religion and of art at the time of their appearance in the neolithic age.

The advance is great, for till now researches on the origin of religion and art (such as those made by Taine) were only concerned with modern times, and, even when they referred to primitive man, were limited to the study of savages of the present day, who are the representatives of that part of the human race which is least apt to evolution. It is only in the study of the neolithic age that we have to do with our real progenitors, and we shall see that they, the discoverers of copper and bronze, were less barbarous than they were believed

to be. In the psychology of the peoples we must consider modern savages as degenerate races.

In the still unpublished material connected with the maritime life of the Cretans in the Minoan times, I found new ground for research, and while studying primitive commerce in the Mediterranean I saw with surprise that Italy had taken a much more important part in the development of prehistoric culture than had been till now imagined. The Italian peninsula in the centuries preceding the Hellenic civilisation had a far stronger action of inspiration and expiration (if I may be allowed to use this image) than the Balkan or Iberian peninsulas. The great extent of surface in Italy and the nature of the soil attracted the navigators of the Aegean, and from Italy civilisation was diffused throughout Europe.

The retrospective synthesis may act as a warning and increase our faith in the power of the sea. Before the ocean discoveries, our sea was the school of navigation for all peoples; and power on the sea gave an impulse to civilisation. Art, philosophy, and religion were born in the Mediterranean; in her peninsulas the work of thought and of the hand touched the apogee of perfection, and from Greece were scattered throughout the world the seeds of the ideal life.

It is vain to discuss where history begins and whether it is a science or an art. In writing this volume I have taken no note of such limitations, and I am sure that in treating of prehistory I shall reason as a scientific man. I should like to be an artist to make many wish to read my book, and if I do not succeed in my wish it is not my fault.

Up to the present sufficient importance has not been given to chronology, and to the long duration of the neolithic civilisation and the following age of copper. I would make use of the abundance of archæological material which has been brought to light to call the attention of students to this great extent of time. Some may think that I stop to criticise too minutely in order to find a chronological basis for events; but in the darkness which envelops the times before the discovery of metals it is necessary

to make accurate research to find out where we are in the time which separates us from the picture of civilisation which I have sketched out. It is indispensable to give a less uncertain chronometry to the great neolithic civilisation which before the age of metals spread throughout the Mediterranean basin, and whence rose contemporaneously, like trees grafted on the same stem, the history of Egypt under the earliest dynasties, and that of Crete in the Minoan age, the prehistory of Libya, of Greece, of Italy, and of Spain.

Limiting my work to the exposition of new documents and the analysis of those found by others, I cannot blunt the edges of the too personal character of my book. I hope this is not a grave defect, for the personal stamp is a charm which serves to hold the attention of the reader. He who takes up the book may exercise his critical faculty, because it treats of new material on which the author asks his opinion. The photographs of the finds will have more effect than writing to rouse in the reader the emotion excited by the excavations and to obtain his co-operation in the reconstruction of history.

CHAPTER II

THE ORIGIN OF WRITING

DR. ARTHUR EVANS'S marvellous book on the Minoan script [1] urged me to a renewed study of the subject of the origin of writing, for, as a result of Dr. Evans's work, the theories which would derive our alphabet from the cuneiform characters of Assyria, or the hieratic script of Egypt, are now completely exploded. The origin of writing with alphabetical signs of European type is so closely connected with Minoan civilisation, that my work in popularising prehistory would be incomplete if I neglected this subject, in which the great superiority of Mediterranean culture is shown. Professor Halbherr has encouraged and helped me in my work, pointing out the sources of information, and, besides advising me, has been so kind as to read the proofs of this and other chapters.

Only the first volume of the "Scripta Minoa" (with splendid illustrations and 300 quarto pages of printed matter) has so far been published, but it may be of use towards the diffusion of culture if, with the help of the work of Dr. Evans and of the Italian students of the subject, I give an epitome of the present state of our knowledge of this much-debated question, whose aspect has been unexpectedly changed by the discoveries made in Crete.

I. THE NEOLITHIC AGE

In the prehistoric age in Egypt potters placed their private marks on the pottery which they made, and Dr. Flinders

[1] A. Evans, *Scripta Minoa*, Oxford, 1909.

Petrie [1] has made a collection of these marks, the so-called signaries of the Ist Dynasty, which he discovered on the vases in the tombs of Abydos, and has published in eleven large plates. These signs are so different from the hieroglyphics that Dr. Petrie, with his profound knowledge of Egyptian history, and literature, treated them separately. The origin of this script is lost in the darkness of the neolithic age, for even on the Continent and in Central Europe the potters had the habit of putting their mark upon the vases. This proves (as we know was the case also with stone weapons) that pots were not always made at home, but that there were special factories whose goods were distinguished by the marks.[2] At Tordos [3] in Hungary, for example, makers' marks similar to those of Egypt were found on the pottery, and though the vases are of the neolithic age, the marks resemble the Minoan masons' marks carved on the blocks of Knossos and Phæstos. This fact indicates the existence of a common civilisation over the whole of the Mediterranean and the Continent of Europe, before Egypt and the Isle of Crete possessed a distinct culture of their own. We find the same signs in various countries of the Mediterranean, and Dr. Petrie refers to Spain and Caria as examples, attributing great importance to the fact that they continued in use in Egypt from 6000 to 1200 B.C.

As an instance of the diffusion of these signaries I will cite the fact that in the museum of Taranto I saw the same signs

[1] Flinders Petrie, *The Royal Tombs of the Ist Dynasty*, 1900, part i. Plates XLVI.–LVII.

[2] For the sake of brevity I will not discuss the grave problem of a neolithic script. Dr. Piette (*L'Anthropologie*, 1905, pp. 6, 9, Fig. 11) first called attention to the marks of writing which he found incised on reindeer horns in France; some of them have a certain resemblance to the signs on the Minoan seals; and again in 1908 new proofs were found of the existence of a neolithic pictographic script (Déchelette, *Manuel d'Archéologie*, 1908, pp. 234, Fig. 125). M. Armand Virey has published a most suggestive inscription carved on a stick made from a reindeer's horn. Each word is separated by a vertical line; there are above a score of signs, and they are very complex (*L'Anthropologie*, xix. 1908, p. 422).

[3] H. Schmidt, "Tordos," *Zeitschrift f. Ethnologie*, 1903, vol. xxxv. p. 457.

engraved on the body and handle of some vases found in an excavation made by Professor Viola in the piazza in front of the Municipio.[1]

From the time of the neolithic age certain signs were used by seamen to enable their vessels to be recognised from a distance, some of these signs are shown on Fig. 107. They consist of horns grouped in various ways and fixed upon a shaft, or of figures of animals or branches of a tree. These signs were found upon neolithic vases by Dr. Petrie in Upper Egypt, and Professor Tsountas[2] discovered exactly the same signs in his excavations in Greece. They include fish and figures standing at the prow of the vessels, incised on the vases as we see in Fig. 2. Above these are two vessels which bear as a figure-head a fish fixed on a spear with a flag below. On the three lower vessels the fish is more conventionalised in shape, and has a hook through the middle, the flag is present here also.

I reproduce these figures not only to show the shape of the primitive vessels of the Aegean, but also for comparison with a Minoan vessel stamped on the disk of Phæstos, of which we shall speak presently. Rather important is the hooked line, which is identical in Egyptian and Minoan script; it is probably an alphabetical sign, and the fact that it is the same in the Valley of the Nile and in the Aegean points to near connection in the neolithic age. They were possibly ensigns indicating the name of the owner or his country.[3] Here we have the embryonic form of writing, or the art of expressing ideas by means of a conventional sign.

[1] Dr. Evans, too, says that in the reindeer period signs of alphabetical appearance were used, and are found incised on ivory and on the horns of reindeer. They closely resemble those used for writing by peoples now living in a state of savagery (*op. cit.*, p. 3).

[2] Tsountas, Ἐφημερὶς ἀρχ., 1899, p. 90.

[3] Dr. Bissing ("Les Origines de l'Egypte," *L'Anthropologie*, ix. 1898, p. 409) maintains that the hieroglyphics had an African and not an Asiatic origin. Dr. Berger also, like Dr. Petrie, asserts that there were in prehistoric times conventional signs which were used in the whole basin of the Mediterranean (*Histoire de l'Écriture dans l'antiquité*, Paris, 1891, pp. 324, 332).

2. EGYPTIAN SCRIPT

At the time of the Ist Dynasty the script was already formed, but the traces of the most ancient Egyptian writing have disappeared. A distinguished English scientist, Dr. T. Young

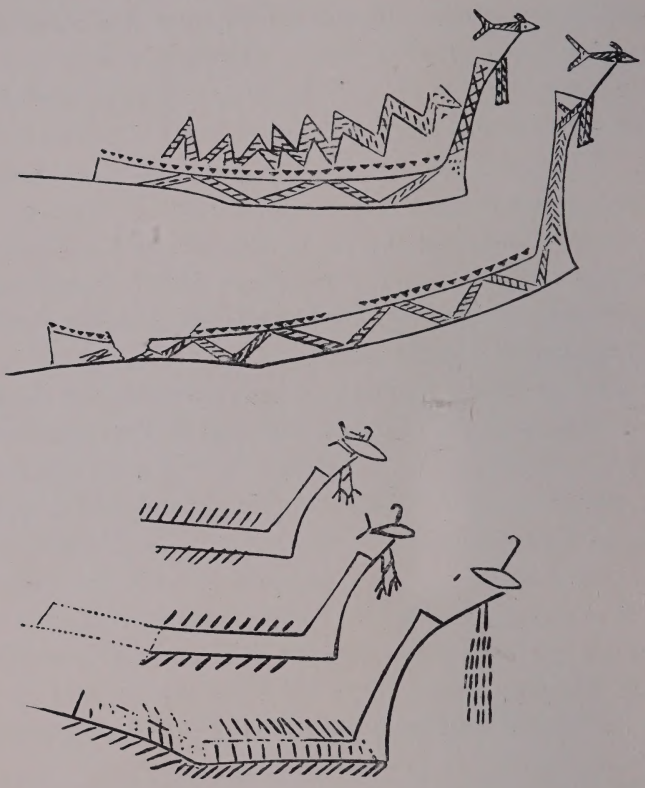


FIG. 2.—SHIPS FROM DRAWINGS ON PREHISTORIC VASES DISCOVERED IN SCYROS.

(well known in connection with the theory of undulations, the perception of colour, the nature of heat, and many important discoveries in electricity and optics), attempted at the beginning of the last century to reconstruct the Egyptian script. Champollion at the same date pointed out that the three systems of primitive Egypt: the hieroglyphic, the demotic, and the

hieratic, were the same script, the two last being the more cursive forms, and he recognised that the hieroglyphics were not only signs of ideas but also of sounds.

The Egyptians continued the use of the primitive hieroglyphics for monumental inscriptions as being more artistic and imposing. For common use the figures were simplified, and gradually transformed till at length two different forms of extremely linearised script were obtained. Medical writings appear to have been very common from the earliest times, as some are considered to have originated under the first dynasties.[1]

Since then, four generations of philologists have discussed the ideas of Champollion and of Dr. Young, and all the variations through which the Egyptian language, its grammar and its script have passed in the course of centuries are known. Beside the alphabetical signs there exist in the Egyptian language a great number of ideographic signs, such as the axe, which we know signifies God, &c.

3. THE CRETAN SEALS

In 1893, Dr. Arthur Evans published his study of the seals, with pictographic signs found by him in Crete. These seals are engraved stones, perforated in the direction of their axis, round or oval in shape, rarely quadrangular or triangular, and were used for impressing a design. Upon these seal stones Dr. Evans discovered above sixty symbols, belonging to a local system of hieroglyphics differing from that of the Egyptians.[2]

The superstition of the Cretan women, who believe that these stones are able to influence favourably the secretion of milk, was of great assistance to Dr. Evans in his search for these seal stones. They are known by the name of galopetre or milk-stones, and by exploring the villages, especially in the eastern part of the island, Dr. Evans was able to collect a large number of impres-

[1] E. Meyer, *Geschichte des Altertums*, 2 Aufl. p. 17.

[2] A. Evans, "Primitive Pictographs, and a præ-Phœnician Script from Crete and the Peloponnese," *Journal of Hellenic Studies*, xiv. p. 270.

sions of these stones, and to demonstrate the existence of a pre-Phœnician system of writing with two distinct phases, one hieroglyphic, the other linear and alphabetic. The Eteo-Cretans, or true indigenous Cretans, have lived in the eastern part of the island in historical times, and an inscription in archaic Greek characters was discovered here by the Italian mission, and two others in non-archaic characters were found in the excavations of the British School. These three inscriptions, unfortunately only fragmentary, are in an unknown non-Greek language, which was possibly the Cretan language before the Hellenic colonisation, and certainly that which was spoken in the district of Præsos until classical times. Even upon the vases Dr. Evans discovered signs of alphabetical writing, and others also were found upon a double axe. The designs, engraved generally upon soft stones like steatite or upon hard stones like cornelian or jasper, consist of interlaced and conventionalised figures mixed with curved and straight linear signs, which are undoubtedly written signs of the pre-Mycenæan period, for they are not simple ornamental designs or decorative forms. Dr. Ed. Meyer[1] notes that seals have an absolutely different name in Egypt and in Babylonia, and that the Egyptian word has probably a Western origin.

The linear figures, which we are unable to decipher, are alphabetical signs. The antiquity of the milk-stones first collected by Dr. Evans was confirmed by a discovery made at Haghios Onufrios, near Phæstos, and I reproduce some specimens in Fig. 3 and Fig. 4; similar seals were found also at Mycenæ. These seals belong to the first half of the third millenium B.C., and therefore to an epoch too early for any Semitic influence, and so remote that we cannot suppose the linear forms of the Cretan script to be entirely exotic.

On Fig. 3 I have collected[2] examples of galopetre bearing

[1] E. Meyer, *Geschichte des Altertums*, I. ii. p. 112.

[2] Dr. Hazzidaki, Ephor of the Museum of Candia, presented me with a set of fifty-five plaster casts of galopetre with alphabetical signs, and I am most grateful to him for this valuable gift. Most of them have been published by Dr. Xanthoudides (Ἐφημ. ἀρχ., 1907).

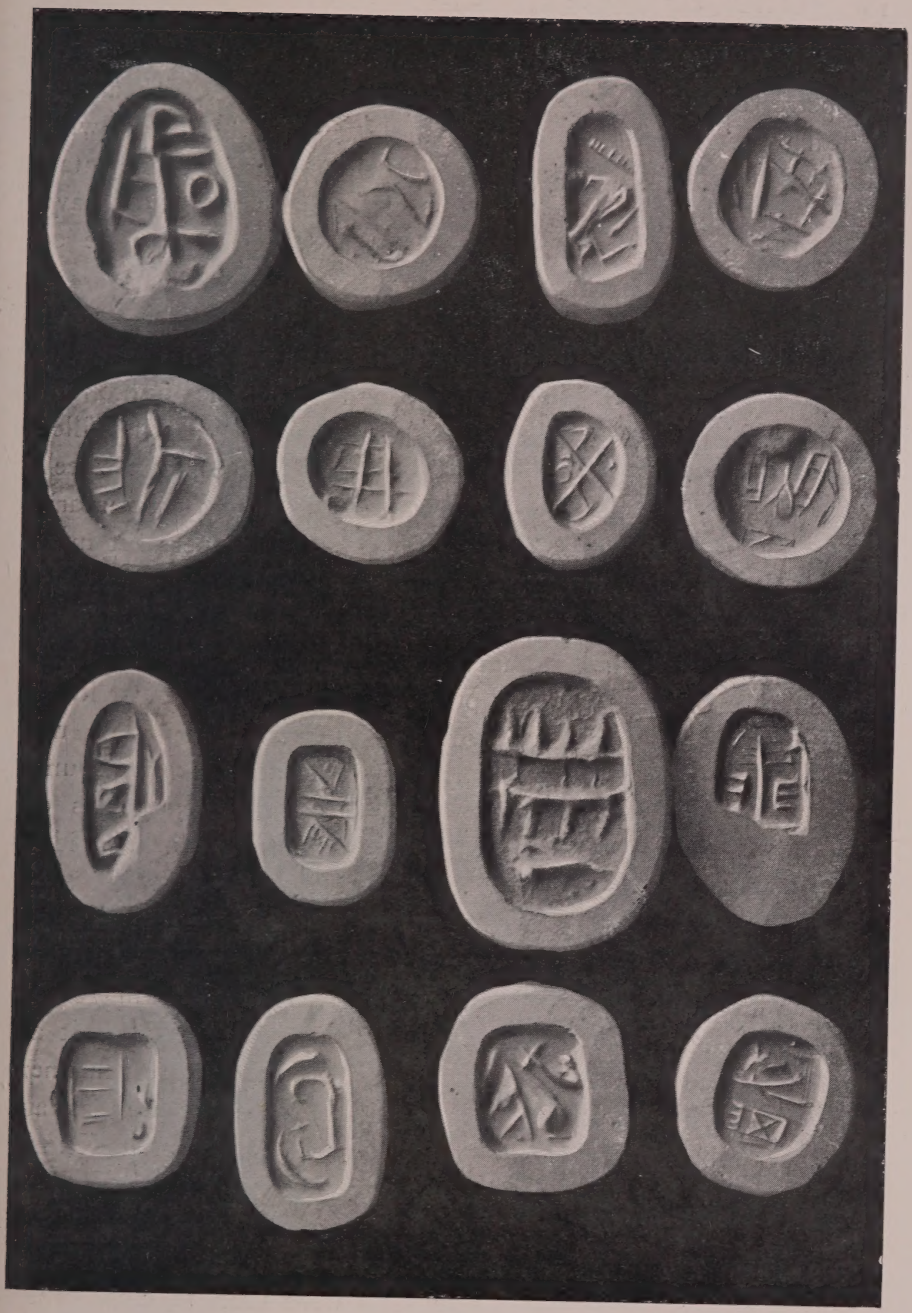


FIG. 3.—CRETAN SEALS.

only alphabetical signs, and on Fig. 4 are other specimens of galopetre, on which we find conventionalised figures with alphabetical signs, figures of the eye, the legs, or of a man with complex designs which do not seem to be merely ornamental, and with sketchy and incomprehensible figures which must have some conventional meaning, or must have been the badge of some person used as his own signet.

These seals are important, for they show us the private life of the Minoan people. On them we see the plough in various forms, the olive branch with leaves and fruit, the fashion of bending the bow, some bold sailors with a bit of the wind-filled sail and the taut ropes, the bull grappling games, cart-wheels with various forms of spokes, arrows, lances, daggers, vases nearly all of the same shape, like those of the age of copper. It must have been the case in Crete as in other countries, that the primitive script was pictographic, and the expression of ideas was manifested by simple images of the objects to be represented, placed one after the other. This method of writing, common to the primitive peoples of America, is still in use among the Esquimaux. The first attempts at expressing sound in Egypt, says Professor Maspero,[1] were made by means of rebuses, figures being used without consideration for the idea they expressed, but simply to represent a sound.

In this way it became possible to depict words which resembled each other in sound but whose meaning was different in the spoken language. Professor Maspero gives the following characteristic example for the Egyptian language, and I think it as well to quote this because it demonstrates in the clearest manner how the earliest writing was formed in the same way as an ordinary rebus. The lapis lazuli is termed in Egyptian KHOS-DOUB. This word is written with the figure of a *man pulling* (KHOS) *the tail of a sow* (DOUB).

The figures seen on the milk-stones probably represent sounds and not objects. These seals were used to close other writings, the clay being used instead of sealing-wax, and the knot

[1] G. Maspero, *Histoire Ancienne des peuples de l'Orient*, 1905, p. 808.

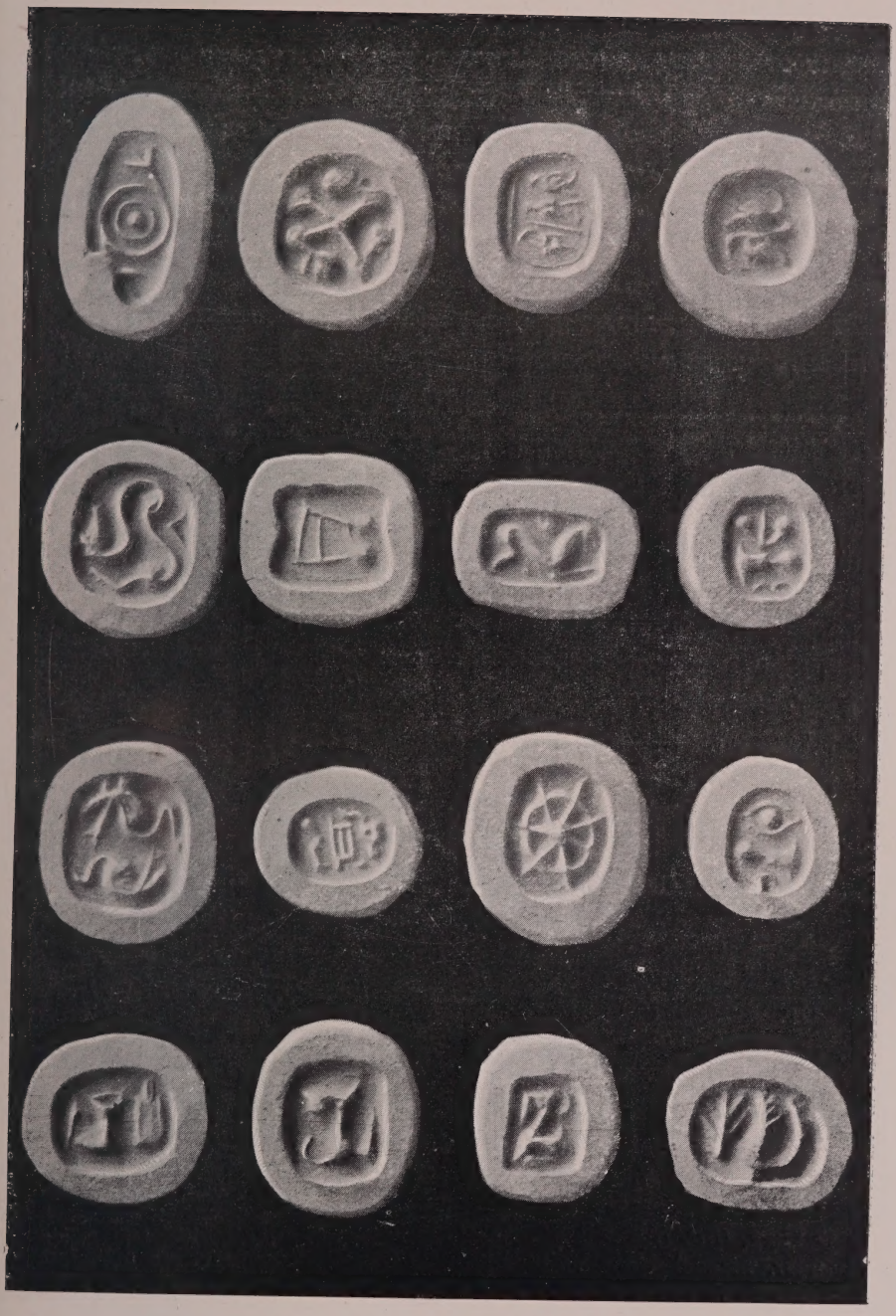


FIG. 4.—CRETAN SEALS.

of the string which tied up a parcel being enclosed in a lump of soft clay, upon which the seal was impressed, just as packages and vans are sealed with lead at the present time. When important officials matters were in question a second seal, held by another person, was impressed by him as a control upon the same piece of clay.

From the great number of seals discovered in a room at Knossos, known as the room of the archives, and in a room called the room of the seals at Haghia Triada, Dr. Evans and Professor Halbherr concluded that as writing with pen and ink was found at the base of the vases, parchment and papyrus [1] were used at that time, and that of these documents nothing has been preserved but the seals, which are partly broken, the organic substances having perished by fire or the effects of time.

Tablets may also have been used for writing on, as in Homer's reference to Prætus.[2]

Pliny tells us that seventy-five years before the Christian Era a letter written on fine papyrus by Sarpedon was preserved in a temple of Lycia from the time of Troy.[3]

4. THE INCISED ROCK CARVINGS

The rock carvings in the high maritime valleys of Liguria have been specially studied by the botanist, Dr. Bicknell,[4] and by Dr. Issel,[5] the geologist.

Dr. Bicknell found in the valley of the Rocca delle Meraviglie linear conventional signs, having, in all probability, the signifi-

[1] Professor Della Seta, after comparison with analogous Chaldæan antiques, recognised an inkstand in a small steatite figure of a sphinx found at Haghia Triada (*Rend. della R. Acc. dei Lincei*, 1907, p. 699 *et seq.*).

[2] Iliad, vi. 168.

[3] Pliny, *Hist. Nat.*, xiii. 88.

[4] Dr. Bicknell alone made nearly six hundred copies, and published the photographs in the *Atti della Società Ligustica di Scienze naturali e geografiche*, vol. viii. Genoa, 1907, vol. x. 1899.

[5] Dr. Issel reproduced some of Dr. Bicknell's plates, and extended the study of this subject, with many illustrations, in his recent volume, *Liguria preistorica*.

cance of alphabetical signs. The figures are formed by a number of concave dots made by a sharp instrument, probably a sharp stone scalpel worked with a mallet. Dr. Issel, after a careful examination of the surface of these cavities, denied the possibility of their having been made with tools of metal.[1]

There are many figures of oxen, ploughs with the yoke, heads with curling horns probably intended for rams, stags, and goats ; crosses and small circles with strokes which seem to be arranged to represent a numerical value. The figures of men are common, and certain crutch-shaped signs probably had a phonetic value. Others, such as shepherds' crooks, end in a spiral. There are double lines and others bent into a U or a V, like the prehistoric characters of Egypt, and outlines of vessels, besides complicated linear patterns which are unintelligible.

Other rock carvings like those of Finland are formed of deep furrows made with a not very sharp tool. Similar designs are found carved on rocks in Switzerland[2] also, and Senhor José Fortis discovered among the sculptures in Portugal megalithic images similar to these.[3] Writers on the subject do not, however, all agree in assuming these signs to be alphabetical characters. Dr. Issel, for example, believes them to be symbolical figures sculptured in fulfilment of some religious rite ; but the figures which he examined are anterior to the hieroglyphics of the Val d'Inferno and of Fontanalba studied by Dr. Bicknell. The fact that these carvings are made upon high rocks, where it would be inconvenient to stand for the work, proves that they were considered to be of great importance, and had probably a religious or political significance, possibly as a record of a victory obtained or of treaties or agreements between neighbouring tribes. That these rock inscriptions belong to the prehistoric period may be argued from the form of the stone or bronze axes

[1] *Bullett. paletn. ital.*, xxvii. 1901, p. 217. In this paper he has included the bibliography of recent publications on this subject.

[2] Reber, *Archiv für Anthropologie*, xx. p. 375, xxiv. p. 91.

[3] *Congrès préhistorique de France, Compte rendu, 2e session*, p. 350, Paris, 1907.

and the shape of the knives, which like the axes in some cases have a handle and in others have none. Rock carvings are common in the north of Africa.[1] In some there is a representation of a large animal resembling the bison—the *Bubulus antiquus*—a species now extinct.

Designs of the same description appear later on upon the dolmens of Northern France. For these I refer the reader to the plates published by Dr. Montelius[2] and Professor Sergi.[3]

Dr. Evans admitted the resemblance of the signs carved on the rocks of the Alpes Maritimes, and especially those of Fontanalba and the Lago delle Meraviglie, with the linear script of Crete as seen upon the galopetre,[4] whence he concluded that in the prehistoric age there already existed a linear script common to a great part of Europe.

5. THE DISK FROM PHÆSTOS

The clay disk found by Dr. Luigi Pernier[5] in the palace of Phæstos in July, 1908, is one of the finest discoveries made by the Italian Archæological Mission towards the history of writing. This most precious document came to light, with a tablet to which I will return later, in an archæological stratum of the most ancient palace of Phæstos, the period Middle Minoan III., about the eighteenth century B.C.

This disk, of very fine and well-baked clay, is in a perfect state of preservation. It is not quite round, and its diameter

[1] Flamaud, *Bulletin de la Société d'Anthropolgie de Lyon*, xx. 1901, p. 181.

[2] Montelius, *Orient und Europa*, 1899, p. 72.

[3] Sergi, *Europa*, p. 186.

[4] A. Evans, *Journal of Hellenic Studies*, xvii. 1897, p. 392. In the caves of the Pyrenees at Niaux in France, near Tarascon-sur-Arriège, paintings and carvings are found upon the walls in which pictographic inscriptions in red and black may be recognised among the figures of deer, horses, bison, and fish, drawn with great exactness, *vide* the photographs recently published by Dr. Castailhac and the Abbé Breuil (*L'Anthropologie*, xix. 1908, p. 40).

[5] *Ausonia*, iii. 1909, p. 355. Dr. Pernier has published another report, with further particulars, in the *Bollettino d'arte del Ministero della Pubblica Istruzione*, 1909.

varies from 158 to 165 millimetres. Nor is it of uniform thickness, but varies from 16 to 21 millimetres. These irregularities, with the slight thickening of the surface towards the centre, and

FIG. 5.—DISK, WITH HIEROGLYPHIC INSCRIPTION, FROM PHÆSTOS.

(*Face A.*)

the irregularities of the periphery of the reverse side, prove that it was not made in a mould but that the irregularity proceeds from its having been made of a ball of clay pressed upon a flat surface while still soft. For greater exactness I will use Dr.

Pernier's own words. "Both the faces are covered with incised lines and small figures impressed while the clay was still fresh. A spiral line was first traced on each face, and the figures were then stamped in the zone between the lines." [1]

The figures are separated into groups by means of lines drawn from one ring to another in the radial direction. Certain small strokes are drawn with a hard point from the base of various figures to the edge of the disk. These small strokes are not casual scratches, but have a distinct meaning in the significance of the text.

The signs, numbering 122 on face A and 119 on face B, are divided respectively into thirty-one groups and thirty groups. They contain forty-five different types, and are all representations of creatures or of objects. The invention of printing is closely connected with these first attempts, in which a punch was used to leave an impression on the soft clay instead of using movable characters like those of Gutenberg.

The conventional signs were probably fixed in pieces of wood or ivory; but these figurative or symbolical images, which represent a thing or an idea, have no alphabetical value. The fact, however, that forty-five different punches were used to impress this disk suggests a primitive printing office.

6. SHORT ACCOUNT OF THE HIEROGLYPHICS UPON THE DISK [2]

To save space I only reproduce one photograph of the disk, showing face A. For face B I give Dr. Della Seta's transcription (Fig. 6), on which the inscription can be more easily followed.

[1] Dr. A. Della Seta presented a note on this disk to the Accademia dei Lincei, May 16, 1909. The note was printed in December in the *Rendiconti* (p. 497), and a photograph of the disk having been sent by Dr. Pernier to Dr. Evans he at once included two chapters on the subject in his new work (*Scripta Minoa*, p. 22 *et seq.*, p. 273). It is important to note that in this independent examination the different authorities came practically to the same conclusions. Dr. E. Meyer also arrived independently at the same conclusions (*Sitzungsberichte der K. Preuss. Akad. der Wissensch.*, 1909, ii. p. 1022).

[2] The opinions of the authorities vary as to whether the inscription on face A or that on face B should be read first. Dr. Evans considers that the

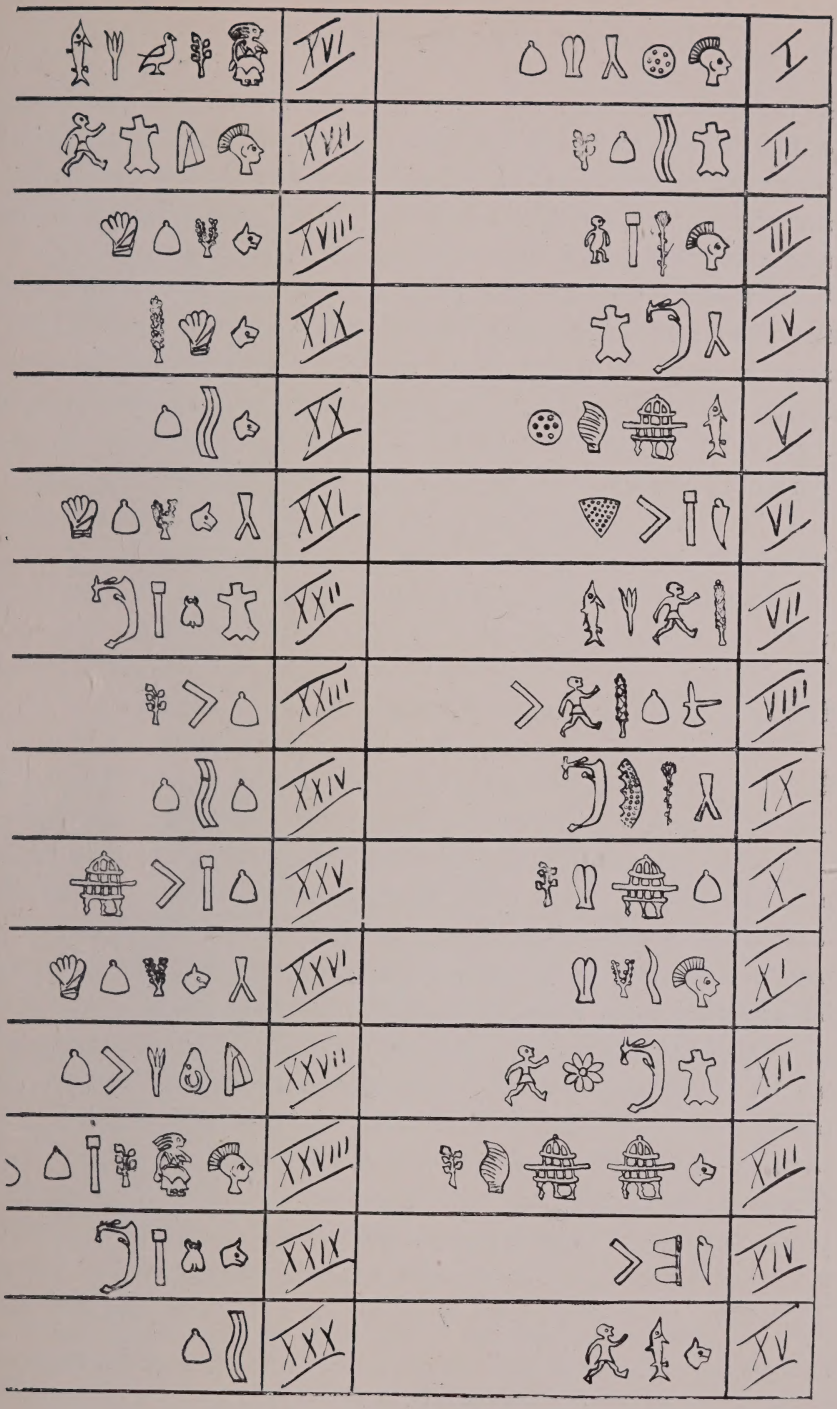


FIG. 6.—TRANSCRIPTION OF THE INSCRIPTION ON THE PHÆSTOS DISK.
(*Face B.*)

As the authorities are not agreed as to whether the inscription should be read from left to right or from right to left, I shall follow the eclectic method and represent face B according to the interpretation of Dr. Della Seta, and will examine face A in the inverse order given by Dr. Pernier and Dr. Evans.

In the centre of the disk (Fig. 5) is a marguerite flower, and this rosette shape is found three times upon this face. Then comes a man's head, turned to the right, with smooth rounded skull. Two circles clearly indicated on the cheek may represent a coloured design stamped by a pintadera, or a tattoo mark. This head occurs twice on face A.

The arrow occurs four times on face A, and ends this first group.

The figure in profile of a man running with the left arm raised is six times repeated. His clothing consists of the common form of the *zoma* of Minoan type, a cloth tightly bound round the waist and covering the loins.

Then comes a knotted stick, which occurs three times, or if not a club, it may be a stylised tree, ending the second group. The third group is more complex, and the first figure is doubtful. The second is a flower, the third an olive branch, and then come two ox-hides. Then a disk, which probably represents a round shield, with six bosses near the edge and one in the centre, or it may be a libation table. Dr. Pernier suggests that this sign may be a conventional representation of the disk itself.

The male head, which occurs fourteen times, is worthy of special study, as it probably represents a Philistine ; and as the country of the Philistines is closely connected with the origin of writing, it will be more convenient to examine it later. The fourth phrase is identical with the first. In the fifth group is a plane like that found in the hieroglyphic inscriptions of the palace of Knossos. The column with capital occurs five times. This form of column, slightly diminishing towards the top and

inscription on face A is the continuation of that on face B, while Dr. Pernier is of the opposite opinion. Dr. Della Seta, too, looks upon face B as the continuation of face A.

with a rectangular capital, is one of the characteristic types of Minoan architecture. A bird with outspread wings appears to be an eagle holding a serpent in his talons. These bird figures often appear in both classes of linear Cretan script.

Of importance is the figure of a vessel in the twelfth group, it occurs twice upon face A. This vessel differs from those occurring in the hieroglyphics and in the linear documents of Crete, and as I have specially noticed the Minoan ships in Chapter XVII., I here refer to Dr. Evans's observations on this vessel. As it appears from Fig. 160 the Minoan ships have oars as well as masts and sails. Sometimes we only find half the vessel with a sail and part of the mast. Here both oars and mast are absent. An arrow passed through the prow is a sign to enable the vessel to be recognised. Here also, as in the illustrations of Dr. Tsountas, there is a flag below.

The absence of sails in this ship suggests that it came from a place not far from Phæstos. Below, in the twenty-fifth compartment, we find the *cestus*, somewhat damaged by a fracture. The same figure occurs four times on face B. This record of gymnastic exercises is important, for we find a similar apparatus used in the games represented on the conical vase from Haghia Triada.[1]

Dr. Pernier sees in the disk a product of Cretan civilisation. The fact that there are many signs differing from those shown on the milk-stones may be explained by the possibility that a different period in the development of Cretan hieroglyphics may here be represented, or that local differences may have existed in Cretan script. Dr. Pernier points out that the ancient Cretans were an essentially polyglot nation. In the historical period in Crete the archaic alphabet varied according to the region, so that the alphabetic groups of Axós, Eleutherna and Prinià, Gortyna and Lyttos can be distinguished.

[1] It is unnecessary to carry further this detailed examination of the impressed signs upon the disk. There are two fundamental theories, neither as yet proved. It is an open question whether the disk is a local production or a document brought from abroad to the palace of Phæstos—a letter or a treaty.

Dr. Pernier attributes a sacred character to this disk, while for Dr. Della Seta it is a pure and simple record of script, not a negative matrix for the production of positive copies, but an individual work with its irregularities and its corrections. The signs have a value partly ideographic, partly phonetic; the groups of signs separated by vertical lines are not simple words, but more extensive combinations containing a complete statement.

Dr. Evans agrees with Dr. Pernier that the division marked on the disk represents different words, and that part of the inscriptions, like the Minoan inscriptions, have phonetic characters. He believes, however, that this system of hieroglyphics is not absolutely Cretan in origin, but is connected with Anatolia, so that the disk would, in that case, be less ancient than Dr. Pernier believes.

The figure of a woman of broad and heavy build, in complete contrast to the slender figure of the Minoan women, the pagoda-like building, the bow composed of horns, and, above all, the tiara which Dr. Evans connects with a Hittite form, all these have persuaded him that the origin of the disk must be sought in Anatolia, and he is of opinion that a culture identical with that of Crete existed on the coast of Asia Minor, and probably in the area of Lycia, so that the people to whom the disk belonged spoke a language related to the Minoan tongue.

To avoid the difficulty of the divergences, and explain the hieroglyphics of the disk, Dr. Pernier supposes a system of local hieroglyphics to be represented, parallel to the script of Knossos but differing from it. The question is complicated, and Dr. Della Seta is inclined to make the disk come from Cyprus. In Dr. Evans's opinion these are not true Cretan characters, and he will not allow that the hieroglyphics are a variety of the script of Phæstos. The female breast, whose image appears rather frequently, as we see on Fig. 6, B, and the fact that this female breast is nearly always near the head of a lioness, make Dr. Evans think that it is a sacred object dedicated to the cult of the Great Mother as worshipped in Anatolia, where she was imported from Crete. Cybele, the Mother Goddess, is represented on gems

and on Minoan and Mycenæan rings as surrounded by lions and beasts of feline appearance like those on the disk.

Besides the language problem this monument has given rise to a discussion on the ethnic nature and history of the rivalry between the princes of Knossos and Phæstos. When the authorities are not in agreement I abstain not only from giving an opinion, but also for brevity's sake I abstain from stating the facts which they put forward in support of their opinions.

7. THE LINEAR SCRIPT, SYSTEMS A AND B

One of the greatest inventions of antiquity was the discovery that any speech may be expressed by the combination of a small number of signs representing the sound of the word, and that it is enough to write this sound for others to understand it and to repeat it with the voice. The consonants suffice to form the recognisable skeleton of a word, and thus we see that at first vowels were not used, but were afterwards inserted between the consonants in order to make reading easier. The Egyptians, however, never adopted this mode of writing by using the alphabet only, but, as I said at first, they always kept between the letters other signs representing objects, to facilitate, as it were by means of ideograms, the interpretation of phonetic signs, so that we cannot seek for the real origin of our script in the Egyptian hieroglyphics, though vases have been found even of the time of the Ist Dynasty with inscriptions made by a brush with ink.[1]

I have already published, in "The Palaces of Crete," some photographs of tablets from Phæstos,[2] and I now give two others (Fig. 7). If we open the glass case where they are kept in the Museum of Candia and take out some of these clay tablets, we are struck by their resemblance both in colour and shape to pieces of chocolate. After the first feeling of surprise at the sight of this mysterious library we experience another,

[1] Petrie, *Royal Tombs*, ii. 13.

[2] *Palaces of Crete*, pp. 71, 72, 73, 155.

caused by the fact that fire has not destroyed them, but rather, by heightening the firing process, has rendered the inscriptions firmer and more durable. We are indebted to the Italian Archæological Mission for the two specimens of these tablets, which are now in the Prehistoric Museum of Rome.

On comparing the signs with those of the galopetre (Figs. 3, 4), we find that several of the alphabetical signs are the same. Besides this form of script, known according to Dr. Evans's classification as Class B, and that of the Phæstos disk described

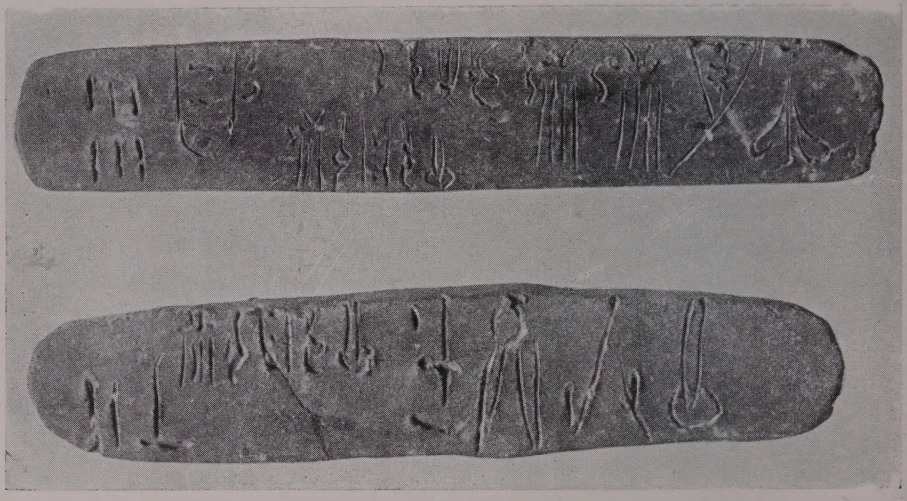


FIG. 7.—TABLETS WITH LINEAR SCRIPT, CLASS B.

above, the Cretans had a third system of writing known as Class A. In 1886 Professor Halbherr, together with Dr. Hazzidaki, explored for the first time the cave on Mount Dicte, where, according to Hesiod, Zeus was born. When Dr. Evans was on Mount Dicte in 1906, the excavations had scarcely been begun when a peasant brought him a broken libation table with an inscription and a steatite tablet with three cavities, also some vases found near. Dr. Evans decided that this libation table belonged to the latest Mycenæan period ; a sword-hilt too, which was found close by, resembles Mycenæan swords of Italy, and the knives are similar to those of the terremare.

Dr. Evans, when publishing these eight letters of the incomplete inscription, said that their great value consisted in the fact that they undoubtedly have "syllabic force," and form part of a dedication. He considers that this inscription dates back to 2000 B.C., and is not only earlier than any Greek attempt at writing, but is also at least one thousand years earlier than the first examples of the Semitic alphabet. In 1903 Dr. Evans discovered another inscribed clay tablet,[1] on which the characters differ from those illustrated in "The Palaces of Crete," pp. 72, 73,[2] and by making use of the material collected by Professor

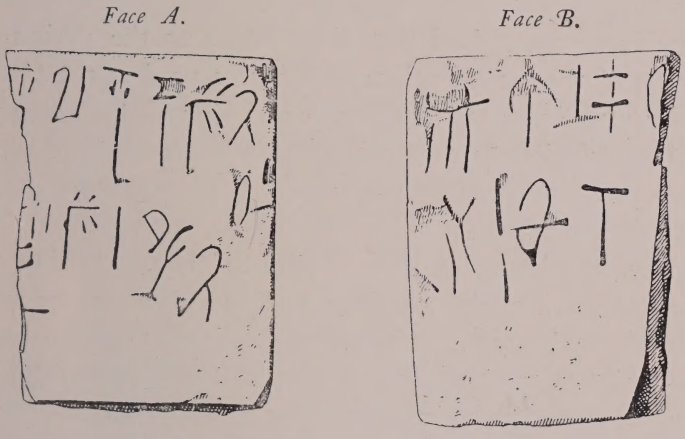


FIG. 8.—TABLET WITH INSCRIPTION, CLASS A, ON BOTH SIDES, DISCOVERED AT PHÆSTOS.

Halbherr,[3] he was able definitely to establish the characters of this script, Class A.

Dr. Pernier discovered another document (Fig. 8) in the same script. This form, though not the one most commonly adopted in texts of the same class, corresponds to that of the only other tablet from Phæstos,[4] and its special characteristic in being inscribed on both sides has been met with also in the case of the tablets from

[1] *Further Discoveries*, p. 361.

[2] A. Evans, *Knossos Excavations*, 1903, ix. p. 51.

[3] *Monumenti Antichi*, xiii. p. 21.

[4] Pernier, *Monumenti Antichi*, xii. Plate VIII.; Halbherr, Idem, xiii. 26, Fig. 11.

a private house at Haghia Triada.[1] From these small tablets of clay we see the method in which documents were written at the end of the Middle Minoan[2] period in the last epoch of the primitive palace of Phæstos, which corresponds to the first epoch of the second palace of Knossos.

The clay, not over-much purified, is brown in colour; while still soft the signs were traced on both faces with a hard point, and the tablet was then exposed to a fairly intense firing. The writing on both sides goes from left to right, as is the case on the tablets of linear script both from Knossos and Haghia Triada.[3]

Dr. Evans recognised that the Cretans at the period of the beginning of the second palace of Knossos used at the same time two forms of linear script, Class A and Class B.[4] These classes are distinguished from each other by the form of the documents, by the system of numeration, and by the appearance of certain typical characters. It is to be feared, however, that their interpretation will be of little service to history, because nearly all the tablets contain numbers and are business documents, inventories, and notes. These early scripts, together with the hieroglyphics of the clay disk of Phæstos, give us an idea of the culture of the Minoan people. But the Cretan race was not Hellenic. Herodotus says that the Cretans were barbarians,[5] and the Odyssey describes them as speaking divers languages. Traces of writing are so rare at Mycenæ and Tiryns that from this circumstance alone the superior culture of the Cretans might be argued.

The Ephor Xanthoudides recently published another inscription[6] written round the edge of a votive lamp of steatite (Fig. 9). This object was discovered near the village of

[1] Length, 34 millimetres; breadth, 45 millimetres; thickness, 6–9 millimetres.

[2] Middle Minoan III.

[3] A. Evans, "The Palace of Knossos," vi., *A. B. S. A.*, 1900, p. 59.

[4] A. Evans, "The Palace of Knossos," ix., *A. B. S. A.*, 1902, p. 52.

[5] Herod., *Hist.*, i. 173.

[6] S. A. Xanthoudides, Ἐφημ. ἀρχ., 1909, p. 179.

Archanes, not far from Knossos, in the midst of a ruin of the Minoan age; the incised letters probably form a votive or dedicatory inscription.

8. THE SIGNS IN LINEAR SCRIPT UPON THE BLOCKS OF THE WALLS IN THE MINOAN PALACES

We are ignorant as to where the linear Cretan script originated, for similar characters of greater antiquity were found in

FIG. 9.—VOTIVE LAMP, WITH INSCRIPTION OF TYPE RESEMBLING CLASS A, FOUND AT ARCHANES.

Melos,[1] and it seems more and more probable that before the Egyptian hieroglyphics were invented groups of conventional signs, which were the first written characters and dated from the neolithic age, existed all over the Mediterranean basin. I have

[1] *Excavations at Phylakopi in Melos*, p. 184.

already alluded to the fact that the signs carved on the blocks of the Cretan palaces, which must be earlier than any other graphic expression found up to the present in this island, are met with even in deposits of the neolithic age in Central Europe, as at Tordos.

Dr. Pernier has made a study of the signs incised on the blocks of the ancient palaces of Phæstos and Knossos, and I have illustrated some of them in the "Palaces of Crete," Chap. II., Fig. 22.[1]

Among these signs the Latin cross and the so-called S. Andrew's cross are frequent; in another the body of a man is indicated by one line and the uplifted arms by two lines below the head. There are also the pastoral crook, the cross, the circle, a flower, a C, and also three lines in the form of the Greek π, but more frequent are the double axe, the star, the trident, and a ladder formed of two vertical lines and two placed in a horizontal direction for the posts.[2] Sometimes instead of a single sign there are several on the same stone,[3] or a complex sign, such as a circle containing a cross with hooked lines at the edge. The marks on the block have sometimes one or more short strokes resembling accents, or are repeated on the blocks forming the same wall, so that at Knossos we find one room of which all the blocks are marked with the double axe. This circumstance caused Dr. Evans to suppose that these signs had some symbolic or religious character.[4] On another wall near a window nearly all the rectangular blocks were marked with a distaff with the thread attached to a sort of spindle; the distaff is not very distinct and might be taken for a sistrum. The theory that these marks might be signs of consecration is less possible at Phæstos. Dr. Adolf Reinach[5] points out in disproof of Dr. Evans's theory

[1] L. Pernier, *Monumenti Antichi*, xiv. 1905, p. 431.

[2] *The Palaces of Crete*, p. 62, Fig. 22.

[3] *Monumenti Antichi*, xii. 91, Fig. 25.

[4] A. Evans, "The Palace of Knossos," *A. B. S. A.*, viii. p. 65.

[5] Ad. Reinach, "A propos des Empreintes Murales de Knossos," *Revue des études grecques*, xviii. 1905, p. 76.

that these same signs—the trident, cross, arrow, double axe—are found also upon the bronze ingots. The svastika also is found among them, and this is not a religious sign from the East, for it is used upon neolithic pottery as a potter's stamp both at Tordos and in South Italy.[1]

Inscriptions have been found scratched upon the stucco of the walls of Knossos, as at Pompei, but unfortunately we are unable to understand these graffiti.[2] Remarkable graffiti exist also on the wall of a small room adjoining the room of the paintings at Haghia Triada.

9. THE CRETAN PHILISTINES AND THE PHŒNICIAN ALPHABET

It is generally believed that the Phœnicians invented the alphabet, the tradition to this effect having been first put forward by Herodotus and then accepted by Plato, Diodorus, and Tacitus. Herodotus says :—

"These Phœnicians, who came with Cadmus, . . . introduced among the Greeks many other kinds of useful knowledge, and more particularly letters, which in my opinion were not before known to the Grecians. At first they used the characters which all the Phœnicians make use of, but afterwards, in process of time, together with the sound they changed the shape of the letters." [3]

The Cretans opposed this tradition of Greek antiquity, and Diodorus [4] writes : "The Cretans say that the Phœnicians did not invent letters, but only modified their form." This suggests that the prototypes already existed, and the Cretans probably meant to say that they had discovered them and that these were the signs used in their prehistoric script.

The last remnants of the ancient Aegean script were still used in historic times in Cyprus only, where it persisted among

[1] Pigorini (*Bull. paletn. ital.*, 1904, p. 91) is of the opinion that the signs on the ingots of bronze are alphabetical.

[2] Evans, *Scripta Minoa*, p. 51.

[3] Herod., *Hist.*, v. 58. [4] V. 74.

the Greek inhabitants until the late Ptolemaic period. As for the Phœnician or Canaanitish writing, whose centre or primitive seat was the coast of Syria and Palestine, we cannot believe it to be much more ancient than the thirteenth century B.C. Mr. H. R. Hall[1] says that up to at least the fifteenth century, and probably till the thirteenth, the script of Palestine was the cuneiform syllabary of Mesopotamia, and it has been thought that the Canaanitish script originated either in this or in the Egyptian Hieratic script. Both theories are now shaken and, we may say, abandoned.

FIG. 10.—HEAD OF A PHILISTINE, TEMPLE OF MEDINET-HABU.

On the other hand, there are strong indications that Canaanitish writing was formed under the influence of the Aegean script. The biblical and Egyptian sources agree in making the Philistines come from the isles of the sea, and in the lower part of Palestine we find a nucleus of non-Semitic population—the Philistines. The southern tribe of the Philistines is called in the Bible the tribe of Cheretim, and was led over by the seventy Cretes (κρῆτες). Their capital city, Gaza, kept the Minoan name and the cult of Cretan Zeus until historic times.

The discovery of the clay disk at Phæstos throws fresh light on the relations of Crete with the Philistines, and the opinion of Mr. Hall,[2] who derived the Philistines from Crete, is confirmed. The resemblance between the heads of the Philistines who had been overcome and made prisoners by Rameses III. and this Philistine on the Phæstos disk is so striking that the types are indistinguishable. The figures of the temple of Medinet-Habu resemble those of the Cretan disk so closely that I think it may be useful to give an illustration of one (Fig. 10). These problems are of great historical value, and the Italians, who were the first to explore Crete, should soon be allowed the honour of

[1] H. R. Hall, *The Oldest Civilisation in Greece*, p. 115.
[2] H. R. Hall, *A. B. S. A.*, viii. p. 185.

exploring Gaza. Here have been found fragments of pottery similar to that of the "Palace style" of Knossos, a sword of Minoan form, and constructions of Minoan architectural character. The question, as Dr. Evans says, is important, for it contradicts the old idea that the progress of civilisation was from East to West; here we have an example of the opposite.

The origin of writing is of great importance in the history of Mediterranean civilisation. When the idea held that progress came inevitably from the East, it was assumed that the Phœnician alphabet was derived from the cuneiform letters of Assyria. Now, as Dr. Evans observes,[1] this theory has fallen through because it was arbitrary and devoid of foundation. We have a decisive proof of the Minoan influence over Phœnicia in the fact that even in the time of the Ptolemies the Egyptians called the Phœnicians[2] Kephtiu, or Cretans. Dr. Evans[3] notes, in favour of this theory, that the Greek *Phoinikes* signifies red man, and the Cretans are painted in red or with a brown skin in their frescoes. The progress of archæological study is beginning to remove all doubt as to the purely Semitic character of the Phœnicians.

The definitive occupation of the coast of Canaan by the Aegean immigrants must have occurred in the thirteenth century B.C., as an effect of the first ethnic convulsions which preceded the fall of the Minoan-Mycenæan civilisation. The Philistines who landed on the coast of Syria must have held in respect a culture superior to that of the indigenous element, and they possessed, among other things, a linear script. In time the invaders adopted the Semitic speech of the country, but they would keep the signs of their own script to express it in. And this script must have been adopted by the Canaanitish Semites. This seems to be the most probable theory, the more so as several names of the Phœnician (Hebrew) letters cannot be explained by the Semitic language, but indicate a borrowing probably from the Aegean.

This, then, is the state of our knowledge of the system of

[1] A. Evans, *Scripta Minoa*, p. 82.
[2] H. R. Hall, *A. B. S. A.*, viii. p. 163.
[3] A. Evans, *Scripta Minoa*, p. 94.

writing in the Eastern basin of the Mediterranean according to the results of the recent exploration of Crete, so that an attempt at a genealogical tree of the scripts of the Eastern Mediterranean would give—

Aegean script
|
Canaanitish script (Phœnicia)
|
Greek script

The Greek alphabet has only been given in exchange; but it is a gift that has been perfected which the Syro-Phœnician world has given to the Aegean world, now become Greek.

As a result of the latest researches some of the learned wish to go further, and have put the question whether this Aegean script which was already fixed in the Hellenic area has not directly given origin also to the Greek script which succeeded it upon the same soil; in other words, they question if the Phœnician script and the Greek script, instead of being mother and daughter, are not sisters born of the same mother.

Seeing how shaken is the opinion that the alphabet came from Phœnicia, we should remember that from the earliest times there was in Greece a legend which attributed the invention of the letters of the alphabet to Palamedes,[1] whence the ancient Greek letters are by more than one author indicated by the name of Pelasgic letters. Suidas says that the Ionians and Lydians call letters Phœnician from Phœnice, daughter of Agenor, who had invented them; but he adds further on, "the Cretans contradict this, saying that the name of Phœnician was given to letters because it was formerly the custom to write upon palm-leaves (phœnix).

10. THE EPIGRAPHIC EXPLORATION OF CRETE

The most archaic inscriptions which we possess in Crete are the fragments of the ancient decrees and ancient Doric laws of

[1] Herodotus, *Hist.*, ii.

Gortyna, Axos, Lyttos, Eleutherna, and other cities. The temple of Apollo Pythias and the round building of the Agora at Gortyna have given us the most ancient and most abundant

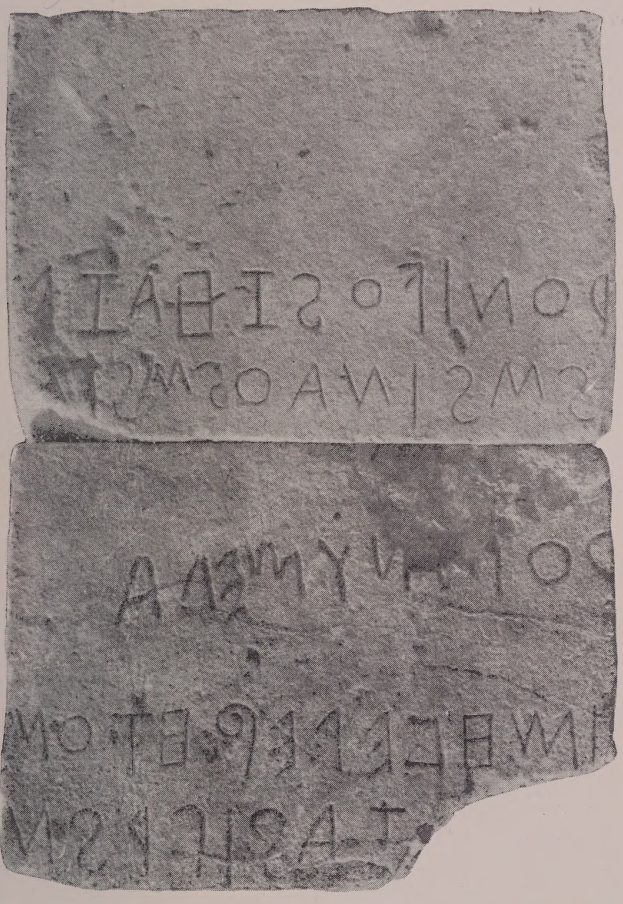


FIG. 11.—TWO LARGE INSCRIBED STONES FROM THE WALL OF THE PRIMITIVE CELLA OF THE PYTHION AT GORTYNA.

(*Mon. Ant. Linc.*, 1907, p. 208, Fig. 12.)

epigraphic material. The letters of all these inscriptions, as may be seen from the illustrations (Figs. 11, 12, 13, 14, 15), represent the earliest stage of Greek writing, only equalled in antiquity by the inscriptions of the neighbouring Island of Santorin (Thera).

The complementary signs are absent, and the letters are of the form nearest to the Phœnician character.

If we examine the fragments of inscriptions from Lyttos we find in place of the O a sign formed of two concentric circles, which rather resembles the linearised pictographic sign of the eye than the Phœnician sign which gave the common Greek O. The Beta, with the spiral, as found at Gortyna, is sought for in vain among the Phœnician prototypes. One of the inscribed blocks

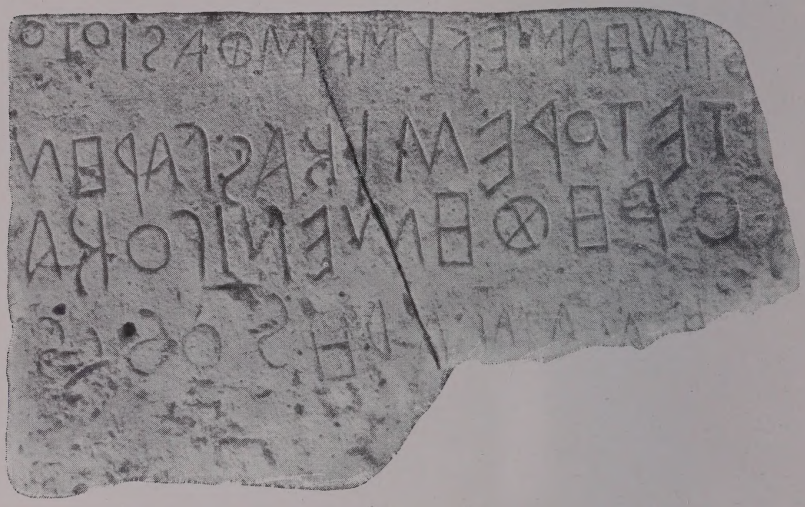


FIG. 12.—INSCRIBED STONE FROM THE PRIMITIVE CELLA OF THE PYTHION AT GORTYNA.

(*Mon. Ant. Linc.*, 1893, p. 20, Fig. 12.)

from the Pythion bears a sign of Minoan appearance which does not exist among the letters of the known Greek alphabet. Besides this, the characteristic Minoan sign of the double axe, either horizontal, ⋈, or vertical, ⧖, occurs as a mark of division or of punctuation between one period and another in the archaic inscriptions of Gortyna and Lyttos.

The epigraphic exploration of the island of Crete, carried out entirely by the Italian Mission, has been on a wide basis, especially at Gortyna, Axos, Lyttos, and Lebena, and the inscriptions

D

E

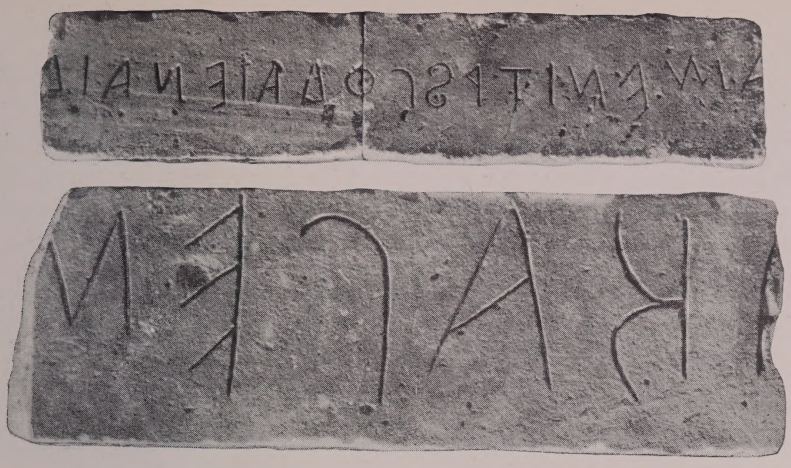


FIG. 13.—STONES FROM THE PRIMITIVE CELLA OF THE PYTHION AT GORTYNA.

(*Mon. Ant. Linc.*, 1907, pp. 209–10, Fig. 18*b*.)

F

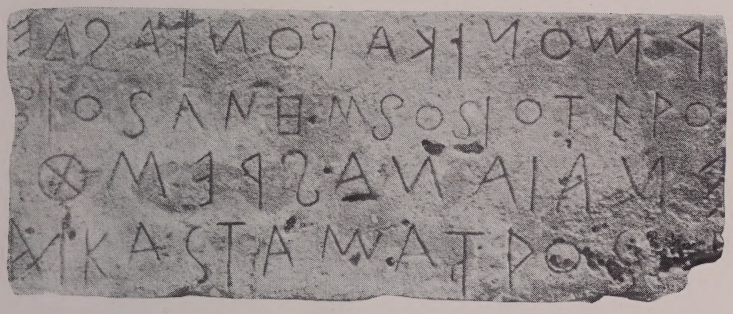


FIG. 14.—STONE FROM THE PRIMITIVE CELLA OF THE PYTHION AT GORTYNA.

(*Mon. Ant. Linc.*, pp. 209–10, Fig. 18*a*.)

G

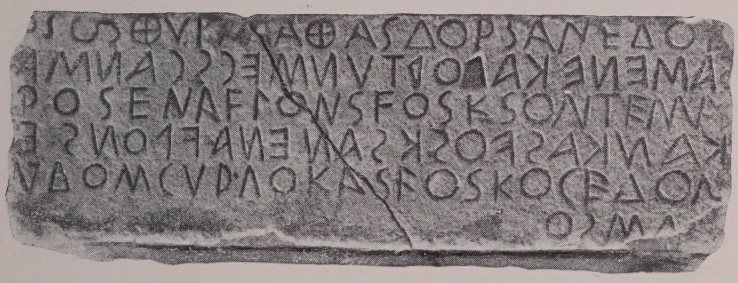


FIG. 15.—STONE FROM THE PRIMITIVE CELLA OF THE PYTHION AT GORTYNA.

(*Mon. Ant. Linc.*, 1907, pp. 211–12, Fig. 19*a*.)

brought to light extend from the seventh century B.C. (the probable date of the inscriptions of the Pythion) to the Byzantine period. In any case, there may yet be discovered by fresh excavations in Crete five times as much as has been already found, for the Cretans did much in the way of inscriptions. On the other hand, much has been destroyed, and the greater part of the Cretan epigraphs are extremely fragmentary.

Between the twelfth century B.C., the period of the latest Minoan inscriptions, and the seventh century, the period of the most ancient Greek inscriptions of Crete, there is a lacuna of four centuries for which we have no written documents.

This lacuna represents the period of ethnic convulsion in the island, when the flood of Hellenic populations poured into the Minoan territory, destroyed its civilisation, and set up a new order of things.

The question presents itself, Did the last remnant of the Cretan population give up writing? Did not the Greeks in Crete begin to write before the seventh century?

It is with a view of answering these questions that the Italian Mission has now undertaken researches in the most ancient Cretan acropoles, the sites where the traces of the last Minoan age are contiguous to the earliest Hellenic strata, the acropoles of Prinià and Aphrati. Until a bilingual inscription is discovered to throw new light on the Minoan writings, these are the bases upon which researches into the origin of writing must move. Though the material collected so far is disconnected, and is only of use in preliminary work, the aid which archæology can give to linguistic studies is evident. Palæ-ethnology has fixed certain points of chronology which are of great importance to the history of Mediterranean civilisation, showing that the origins of writing are of far greater antiquity than had been before supposed; and the excavations of Crete have given us the key to the understanding of the secrets of writing in ages before the time when the cuneiform script of Babylonia and Assyria had appeared and before the hieroglyphics of Egypt had been invented.

Minoan civilisation was so great and so firmly rooted that the

primitive script was, as Dr. Evans has shown, still in use in the age of iron.[1]

The process by which the language and institutions of the Dorians became predominant in the island was gradual and slow, and has been brought about by pacific colonisation. Ancient tradition is confirmed by the absence of any interruption in the culture almost up to the limits of history; this is shown by the Cretan excavations, and further evidence now goes to show that Greek civilisation was the product of an assimilation of the earlier Cretan civilisation.

So the elements of Minoan writing passed into Greece, and the traces of Minoan characters are seen in the archaic inscriptions discovered by the Italian Mission, of which I have reproduced several examples.

A new and important point with regard to these studies is that they have shown that our alphabet was formed without the participation of the Indo-Germanic peoples. From the monuments of Crete pours the spring of writing, rising from a more primitive source than the two linguistic parent stocks, the Aryan and the Semitic. The theory put forward by the students of comparative philology prevails no longer, since the discoveries in Crete have shown that the art of writing existed before the presumed penetration of an Aryan race, or of its influence in the island.

[1] *Scripta Minoa*, p. 101. Dr. Evans notes also that the names of the Cretan cities recorded by Homer in the Iliad are of non-Hellenic origin.

CHAPTER III

EGYPT BEFORE THE PHARAOHS

I. NEOLITHIC INTERMENTS IN EGYPT

IN the Egyptian Museum at Turin is a valuable collection of prehistoric objects from Egypt made by Professor E. Schiaparelli, and I shall make use of this precious material, which he has kindly placed at my disposal. Bodies of the neolithic period, as well preserved as those which I am about to describe, are rare; they were found at Gebelein, about 30 kilometres south of Thebes. There are three bodies—a man, a woman, and a child. Fig. 16 is a reproduction of the photograph of the man, on his head may be seen the remains of chestnut hair with reddish reflections. The three bodies are all lying on the left side in a contracted position (as was the custom in burials of the neolithic age); they were wrapped in fine cloth, and above this was another wrapping with matting of fine reeds well woven together by means of cords.

The spontaneous mummification produced by the absence of moisture in the earth in which the body was buried possibly first suggested the art of embalming.[1] Near the head of this body (Fig. 16) lay a flint saw and a sole, 20 centimetres in length, of hide with the hair on, made to be tied on beneath the sole of the foot. In the leather, in the part near the heel, are two holes through which the cord would be passed to tie on the sandal. In front,

[1] Herodotus, ii. p. 30, says that in the bronze and iron ages mummies were still prepared by cutting the abdomen with a sharp Ethiopean stone. This suggests that the embalming of corpses went back to the neolithic age.

between the big and the little toes, were two little perforated flaps. It is the exact shape of the cioce of the Roman and Neapolitan peasants, and we may suppose that the foot was wrapped in a bandage of linen.

The boy was about sixteen years of age, and was also in the contracted position. A bundle of arrows lies within the cloth in which the body is wrapped; beside him were a bow and a little wooden boat, with some very fine baskets made of plaited straw and reeds, and a piece of bread in good preservation. A terracotta

FIG. 16.—EGYPTIAN INTERMENT OF THE NEOLITHIC AGE, EGYPTIAN MUSEUM, TURIN.

bottle was bound with strips of leather arranged as on the Tuscan flasks. His sandals are well made, the sole edged with a binding of white leather, and the straps used for tying on the foot-gear are also of white leather. A strap passed between the great toe and the second toe, and was fastened to two other straps. The fact that the simple sandal of the Greek statues was worn in Egypt in the neolithic age will not be without interest to students of antiquity.

There are also two leather bags and a boomerang, which the boy used perhaps in hunting, as shown in the frescoes of the Egyptian tombs. From this tomb, arranged with such evidence of affectionate care, we may deduce some ideas on the beliefs of

the neolithic peoples. The objects found in the grave show the primeval belief that the soul remained with the body even after death. The bread and the drinking flask, with the baskets which perhaps contained fruit, and the three bags with the toys attest that even in the neolithic age it was usual to place by the corpse all that might be needed in the life of the underworld. It was therefore not an invasion by a new race come in with the Pharonic Dynasties which brought to the valley of the Nile these funeral customs, making of the tomb a sort of house containing all that the defunct had used in life.

2. COMPARISON OF THE NEOLITHIC POTTERY OF EGYPT WITH THAT OF OTHER COUNTRIES

In the Museum of Turin are ten vases like that illustrated on Fig. 17,[1] found 20 kilometres north of Thebes, close to the excavations of Dr. Flinders Petrie and Mr. Quibell at Naqada. The decoration (Fig. 17) represents a many-oared boat with two cabins in the middle. Below there is a sail, possibly of leather, held up by several yards. I shall refer to this boat more at length in the chapter on navigation. The terracotta is drab in colour, the design brown. The manufacture of stone and alabaster vases was so much extended under the first dynasties that there ensued a decadence in pottery. This decadence is not found in Crete, where the potter's art was continuous. Specially characteristic are certain slender and fragile vases coloured blood-red on the outside, except round the mouth, which is black, like the inside ; the whole surface, in and out, is highly polished.

Very common in Crete and on the Continent, both in the neolithic and succeeding periods, are the black or red vases with the incised lines of the decoration filled with a white substance. These vases have come to light in the whole length of the valley of the Nile. Cups with a decoration imitating the plaited

[1] Sixteen centimetres high. The tubular handles are $2\frac{1}{2}$ centimetres in length.

osiers of a basket, and bands of triangles in which are traced lines parallel half to one side and half to the other, goblets with chess-board patterns in which the alternate squares have depressions filled with a white substance which is very common in Italian and Continental pottery, are all found abundantly in prehistoric Egypt down to the bronze age. The meanders and the bands of angular design, plain upon a ground incised with parallel lines, so

FIG. 17.—EGYPTIAN VASE OF THE NEOLITHIC AGE, TURIN MUSEUM.

frequent in neolithic pottery, are found on Egyptian vases of black, drab or red clay; the rectangular incisions made with a stamp similar to those of the neolithic period in Crete are found also at Dakkeh in Nubia.[1] Another point of resemblance with the pottery of Phæstos is that the vases are decorated not only outside, but also in the interior. Other vases have the whole

[1] Weighall, *op. cit.*, Plate LXXXI. Figs. 35 and 38.

surface covered with zigzag parallel lines such as we find in Italy on the Pulo and in Sicily.[1] Archæology owes to Dr. Flinders Petrie the first comparisons of the prehistoric Egyptian pottery with that of the Aegean. One of the most interesting points with regard to the history of Crete is that vases of Cretan manufacture have been found at Abydos.[2] They are of black clay well polished, with the bottom of conical shape and lip everted.

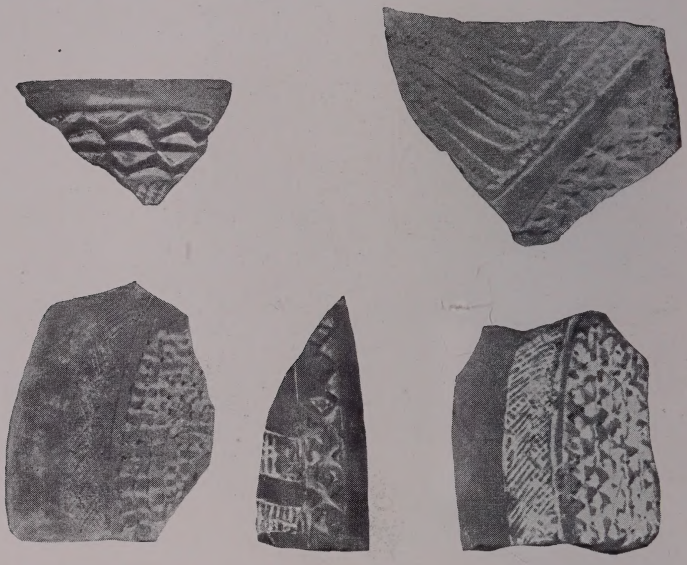


FIG. 18.—NEOLITHIC POTTERY FROM EGYPT.

The potters did not content themselves with the white lines on a black ground, but also inverted the incrustation so that they made a sort of inlaid work in the clay, and the ground stands out with the design in relief from the white substance with which the hollows were filled, as appears in the fragments shown

[1] I do not give illustrations of this black pottery with incised decoration filled with white because Dr. Flinders Petrie has published many examples in several of his volumes on the excavations carried on by him in Egypt (Petrie, *Diospolis Parva;* Petrie and Quibell, *Naqada and Ballas*).

[2] Flinders Petrie, *Methods and Aims in Archæology*, p. 106.

in Fig. 18. This new technique lasted till the first dynasties, as is shown in MacIver's book.[1] We have in Italy a similar style of pottery, both in Sardinia and on the Continent, which lasted from the neolithic period till the beginning of the age of metals, as may be seen in the bowl from Coppa Nevigata, near Manfredonia (Fig. 19), now in the Prehistoric Museum, Rome. The triangles which lie above and below the band are hollowed out, and are, as well as the small holes, filled with a white substance. Other vases with a chess-board pattern, or similar ones with

FIG. 19.—POTTERY OF THE BRONZE AGE, FROM COPPA NEVIGATA, NEAR MANFREDONIA.

decoration of basketwork, came from the Caves of S. Bartolommeo, near Cagliari, and of Matera.[2] We find this chess-board decoration also in the pottery of Butmir.

A third quality of neolithic pottery reaches as far as Nubia; it is coarser, and is decorated with transversal incised lines.[3] These are dotted lines turned back so as to form acute angles.

[1] Randall MacIver, *El Amrali and Abydos*, 1899, 1901, p. 43, Plate V. 7.

[2] Pinza, *Monumenti primitivi della Sardegna*, Plate I. Fig. 7, Plate II. Fig. 11. Colini, *Bullet. pal. ital.*, xxvii. Plate VI. Fig. 5; xxiv. Plate XXVIII. Figs. 1 and 7.

[3] *See* Weighall, *op. cit.*, Plate LXXXVII.

At Heliopolis Professor Schiaparelli dug to a depth of 8 metres to the surface of a neolithic stratum less than 1 metre in thickness. The work had to be done under water, and from the prehistoric dwellings came to light a beautiful collection of neolithic pottery with incised designs filled with white substance, which will shortly be published in another work. These sherds are so similar in decoration to those which I found in the

FIG. 20.—FRAGMENTS OF NEOLITHIC POTTERY FROM THE PULO, NEAR MOLFETTA, SIMILAR TO THE EGYPTIAN NEOLITHIC POTTERY.

neolithic settlement on the Pulo that I think it desirable to illustrate some fragments of the latter (Fig. 20) to convince the reader of the great uniformity found in the neolithic age, so that we find the same decoration in Italy, Crete, Egypt, and in the whole of the Mediterranean basin.

The various neolithic designs known by the name of wolf's tooth, fish-bone, dotted lines, reticulated lines, are, with triangles and chess-board pattern, the commonest motives. The design

with circular and recurved lines is wanting, and there are no figures of animals or plants. This limitation in the repertory of design is another proof of the very remote antiquity of the neolithic age in Egypt. There is little variety in the shapes of the vases, the base is spherical or oval.

I should have liked to give more photographs to make possible a fuller comparison of the pottery of the neolithic age, and hope that this may be done by others who have means for a more extensive work. What I have shown is, however, sufficient to make it clear that there is a great resemblance between the neolithic civilisation in Egypt and that of the Mediterranean, and that they were developed contemporaneously and on parallel lines.

3. EGYPTIAN WEAPONS

In the Egyptian Museum at Turin there are several copper axes which were found near Medinet Abu, and I have to thank Professor Schiaparelli for permission to analyse and describe them. One, shown in Fig. 21, half size, is of triangular shape, and resembles the stone axes. It is in the form of an isosceles triangle with the base slightly rounded. The two edges meet in an obtuse point at the apex where the axe-head was fixed to the handle. The profile also is shown in the illustration. This is the common shape of axes in the Mediterranean countries. Its weight is 400 grammes. On trying it with the file the metal proved to be red and soft with all the characters of copper. The others are also of copper. One very large one is so completely corroded that the file penetrated it to the depth of a centimetre without finding the uncorroded metal. I analysed the metal and found it to be pure copper ; it might be termed a battle-axe rather than a hatchet. The axes in the Turin Museum appear to be of the XIXth Dynasty, and were probably the usual weapon of the soldiers. That it was of copper proves that tin was very high in price, and that the Egyptians were not in a favourable position with regard to the trade in that metal.

The difference of form in the daggers and swords used contemporaneously in the two countries proves that the civilisations of Crete and of Egypt were developed without any close connection. I will only point out the shape of the axes. As shown

FIG. 21.—EGYPTIAN AXE OF COPPER. FIG. 21*a*.—SECTION.

on Fig. 22, they have a short handle and are semicircular on the cutting side, while on the handle side are two deep incisions, also semicircular in shape, which form three points, which pass through the handle and project slightly on the further side. This is the characteristic type of Egyptian axe, which is not found in the Aegean.

Fig. 22 is taken from Rosellini,[1] and shows how the soldiers

[1] Rosellini, *I Monumenti dell' Egitto*, vol. ii. Plate XIX. Pisa, 1834.

of the XIIth Dynasty were armed. At the waist-belt they carry a small knife, which they wear rather differently from the contemporary Cretan soldiers; they have a bow and arrows, a shield and spear. The soldiers of the XIIth Dynasty have also a thin piece of curved wood, the so-called boomerang, which was used too in hunting game, but this piece of wood often appears so thick and long as to be rather a mace or club. One characteristic of the Egyptian soldiers was the absence of the sword, and the

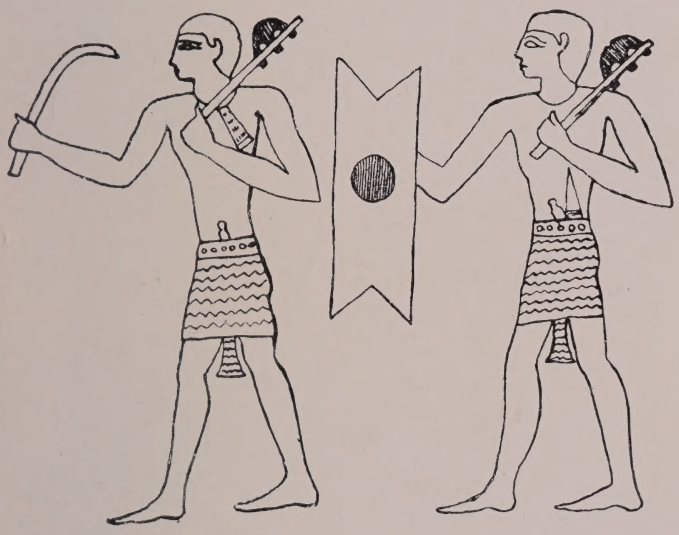


FIG. 22.—EGYPTIAN SOLDIERS OF THE XIITH DYNASTY.

daggers are not more than 30 to 35 centimetres in length. In later times only do the Sardi appear on the monuments with a great copper sword. The Minoan soldiers also carried the boomerang, as seen on Fig. 23, taken from the celebrated steatite vase found at Haghia Triada. A soldier holds a sword in his right hand and in the left a staff, which is bent and flattened at the top. A close examination convinced me that this is really a bent stick. As the soldier wears no helmet it is impossible to suppose this to be the curve of a plume.

The earliest long swords appear on the Egyptian monuments

at the time of the war with the Sardi ; on other monuments only the barbarians have long swords, and the Sardi hold in their hands a dagger of Cretan form. A comparison of the sword and dagger of the Sardi with the sword and dagger carried by the two figures in the second funeral stele of Mycenæ shows that they

FIG. 23.—MINOAN SOLDIER WITH BOOMERANG.

are identical.[1] This comparison of the weapons of Mycenæ, of Crete, and of the Sardi should be taken into consideration by those who study the origin of the Sardi, for similar swords are seen on the Cretan monuments and similar daggers are found traced on the tablets discovered by Dr. Evans in the palace of Knossos.

[1] Schliemann, *Mycenæ*, p. 149.

4. THE BRONZE STATUE OF PEPI OF THE VITH DYNASTY

Professor G. Maspero, Director of Antiquities in Egypt, sent me in response to my request for help in the study of the metals, some valuable material which I have already

FIG. 24.—STATUE OF PEPI, VITH DYNASTY.

published [1] in an article, and to which I will now only refer briefly.

The statue of Pepi (Fig. 24) belongs to the VIth Dynasty; it is life-size, and made of beaten plates of metal held

[1] "Le armi più antiche di rame e di bronzo," *Memorie della R. Accademia dei Lincei*, 1908.

together by rivets. There remain about a hundred fragments of this statue which it has not been found possible to put in place, and Professor Maspero gave me three of the pieces to analyse. Fig. 25 shows one of these pieces with A, the hole for one of the rivets which held together the parts of this statue. At B the plate is bent and forms a V-shaped projection. The plate is little more than 1 millimetre thick, it is much oxydised, and is deep green in colour. Any attempt to bend it causes it to break. Two other smaller pieces of the same plate are bent, one at a right angle, the other at an acute angle, and both are covered with the same kind of granulated green patina.

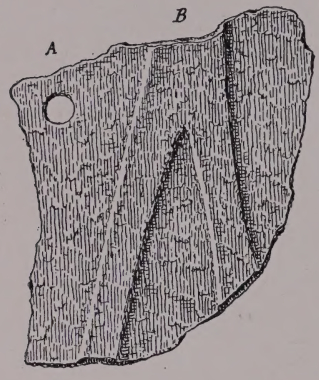


FIG. 25.—PIECE OF BRONZE FROM THE STATUE OF PEPI, OF THE VITH DYNASTY. ACTUAL SIZE.

Our admiration for this masterpiece of Egyptian art is increased when we know from the analysis that this statue is of bronze, which is harder and more difficult to work than copper. The analysis shows 58·50 per cent. of copper and 6·557 per cent. of tin.[1] This was not, however, the primitive proportion of the mixture, for the fragments analysed contained a large proportion of carbonate of copper, and 34 per cent. is carbonic acid, water, and oxygen; a part of the copper is lost, while the tin is more resistant to the action of external agents; however this may be, we must say that this statue is of bronze. Our copper coins contain 4 per cent. alloy of tin to render them hard, and if we add 5 per cent. of tin to copper the mixture is not malleable.

The sceptre of Pepi was analysed by Dr. Berthelot,[2] who recognised that it was of pure copper. Pepi was a famous

[1] This and many of the subsequent analyses were made in the chemical laboratory of the Royal Arsenal at Turin.

[2] Berthelot, *Introduction à la Chimie des Anciens*, 1889.

king who re-established the mines on Mount Sinai, from which he drew a larger return from the trade in copper than his predecessors had done.

The sceptre, which was fixed upon a wooden handle, was a cylinder 12 centimetres in length. The VIth Dynasty artificers had chosen pure copper of which to make the sceptre, because hieroglyphics were to be engraved upon it; for the statue of the king they used bronze, which is a more resistant metal. The hardness of the bronze increased the difficulty of working in repoussé, as the plates of metal could only be worked with the hammer while red-hot. When we contemplate the naturalness and the expression of this statue we are forced to the conclusion that art and metallurgy had already been brought to perfection 3500 years before the Christian Era.

5. BRONZE PLATE OF THE TIME OF THE IST DYNASTY

The plunderers of tombs were and are real masters of the art of seeking out and plundering the graves. So that if a tomb has been meddled with (and few are now intact), we cannot say that there were in it no objects of metal. In fact, when excavated by Professor de Morgan,[1] the royal tomb of Negadah yielded only knives, scrapers and awls of stone. Later and more diligent search discovered in this tomb blades and chisels of copper. The same thing happened in the case of the tombs at Abydos, where at first no objects of metal were found. Later excavations produced important metallic objects, among which is a plate of bronze which M. Maspero kindly gave me to analyse. The piece of metal plate is about 10 millimetres in width, and is shown in Fig. 26. The edge is more even on one side than on the other; it is about $\frac{1}{2}$ millimetre thick, and slightly oxidised. It is unknown what purpose it served, but we can see that it is a thin plate of uniform surface. The analysis shows, copper 96·00, tin 3·75 per cent. We may

[1] De Morgan, *Recherches sur les Origines de l'Egypte*, 1897, p. 7.

therefore conclude that even under the Ist Dynasty bronze was known, and as this is a piece of thin plate, we may add that at the time of the Ist Dynasty the technique of bronze work was sufficiently advanced for bronze to be worked into thin plates—a thing which causes no little surprise.[1]

This piece of bronze plate (Fig. 26) from Abydos, which we analysed, was in such good preservation that we may suppose the original composition of the alloy did not vary much from 3·75 per cent. of tin.

Under the VIth Dynasty, *i.e.*, 3500 B.C., bronze was made with a satisfactory alloy of 9 per cent. of tin, and of this bronze great vases were cast. M. Maspero gave me the edge of a large bronze vase, from which I obtained these data by analysis.

FIG. 26.—PIECE OF BRONZE PLATE, IST DYNASTY. ACTUAL SIZE.

Of the copper which was used in the predynastic period we have many flat axes similar to those of stone which were found at Naqada and Hierakonpolis by Dr. Flinders Petrie, and by Amelinau at Abydos. For the sake of economy it was the custom to put into the tombs representations of these weapons cut out of a thin copper leaf instead of real axes of copper.

But these objects, made simply of thin metal leaf for funereal use, are so plentiful that we may conclude that the use of copper had reached its complete development within the two first dynasties. Four pieces of copper leaf are known in predynastic times, and also a considerable number of small

[1] Further notices on the antiquity of metals are found in the classic work of Montelius, *Die Chronologie der ältesten Bronzezeit in Nord-Deutschland*, p. 147, as well as the bibliography and information on the analyses of the most ancient metals.

objects such as needles, fish-hooks, bracelets, and rings, which have been catalogued with indication of the place of discovery by Dr. Meisner.

No invading race brought into Egypt the knowledge of copper, nor did another people come in later bringing with them the use of bronze; both discoveries seem to have been made in the valley of the Nile.

6. THE AGE OF COPPER IN EGYPT

The most ancient Egyptian tombs contain only stone weapons, till at last, under the Ist Dynasty, a few objects of bronze appear. The tomb of an invading king with all his weapons of bronze has never been found. Up to the present time neither Chaldæa nor Babylonia has disclosed anything more ancient than the copper age in Egypt, and we have therefore no means of comparison with the extreme East.

My chemical analysis of a piece of turquoise given to me by Professor Schiaparelli proves that the Egyptians knew the mines of Mount Sinai from the neolithic age. In the city of Heliopolis, a piece of a heavy green substance of the size of a nut was found in the ground at the water-level. My analysis showed that the substance was turquoise, because it contained phosphoric acid, aluminium, copper, and calcium. Probably the olive-green powder was used to colour the skin, or it was a stone from a broken ornament. Among the most ancient monuments are the stelæ of the king upon Mount Sinai.[1] This is another fact which proves that metallurgy is both cause and effect in the development of civilisation. It was the economic conditions which in Egypt as in Crete prepared the ground for social progress. Dr. Petrie[2] published a diagram showing the copper objects which have come to light at various depths in the excavations made by him in Egypt. First come the pins for fastening clothing, then fish-

[1] De Morgan, *Recherches sur les Origines de l'Egypte*, 1896, p. 192.

[2] Flinders Petrie, *Diospolis Parva*, p. 24.

hooks, chisels for carpenter's work, flat axes, and finally daggers. At Abydos, in the tombs of the Ist Dynasty, Dr. Petrie[1] found only objects of copper.[2] Higher up the Nile too the copper axes were flat. I here show a copper axe (Fig. 27) of identical form but rather shorter,[3] which was found at Licodia Eubea in Sicily. We shall see this

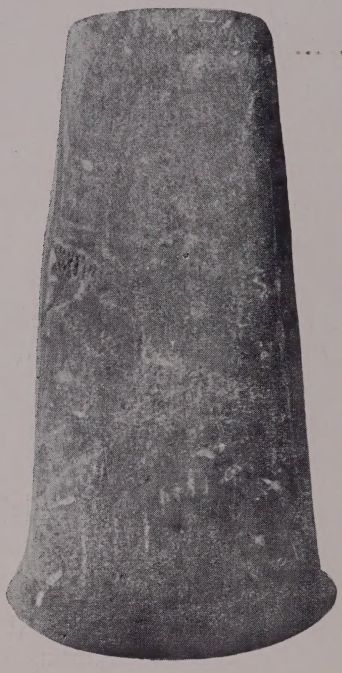


FIG. 27.—FLAT AXE OF COPPER, DISCOVERED IN SICILY, SIMILAR TO THOSE FOUND IN EGYPT.

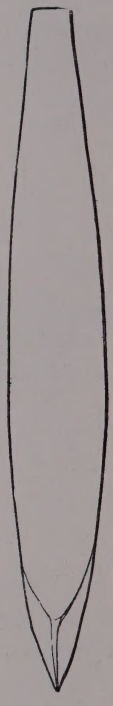


FIG. 27*a*.—SECTION.

form of flat axe scattered all over the Continent, but here in Egypt are the most ancient examples of which we know the

[1] Flinders Petrie, *Abydos*, i. Plate XLIX.

[2] One was analysed and showed: Copper, 98·60 per cent.; tin, 0·38 per cent.; zinc, 1·55 per cent., so that the metal resembles brass in its content of zinc. The ancients did not know this metal in an isolated and pure state, but produced it nevertheless by adding calamine to the copper.

[3] Petrie, *Naqada and Ballas*, London, 1896, Plate LXV. Fig. 32.

date sufficiently nearly. Short daggers similar to those of Crete were also found by Dr. Petrie at Abydos.

7. THE ORIGIN OF BRONZE

In the temple of Abydos Dr. Petrie found two figures of pure copper, of a type which he considers certainly not Egyptian, and which resemble the figures of the Cave of Dicte in Crete.[1] This discovery caused some confusion in the evidence which had been collected in favour of the precedence in metallurgy being given to the Egyptians; but I would not exaggerate its importance, because there are other and stronger reasons for turning our attention to the East in the question of the primitive trade in metals.

Tin is still the least plentiful among common metals, because deposits of tin are rare on the surface of the earth, and it must have been the same in prehistoric times. Cornwall now produces one-quarter of the annual supply, and a large quantity of tin comes from the East Indies, from Malacca, and from Banka Island, near Sumatra. These last centres of production of tin are so far from Egypt that it would be unreasonable to suppose that tin would be fetched from countries many times more distant than England.

In Italy also there are tin mines, and of them I will speak later. There has hitherto been no proof in archæology that tin came from the East Indies, or from other deposits in the extreme East. Ancient writers do not allude to this possibility, and Pliny distinctly denies it. M. de Morgan, who is thoroughly competent on this question, says in his "Voyage au Caucase" that importation from the East cannot be admitted, because the mountains of China where tin is found are too far off.

The vases found at Amerejo in Spain have the characteristic form of the Egyptian vases[2] of the close of the neolithic age. The resemblance of the Egyptian idols with

[1] Petrie, *Abydos*, ii. Plate V. Figs. 34, 35.

[2] Paris, *Essai sur l'Art et l'Industrie de l'Espagne primitive*, 1903, p. 49.

those of Crete and of the Continent is an established fact; the burial sites are similar; the flat copper axes of Egypt cannot be distinguished from those of the Continent;[1] the evolution of art in Southern France and in Spain went on during the neolithic age, and we know that navigation was general on the Mediterranean in the times preceding the introduction of copper—all these data give good reason to suppose that the predynastic Egyptians had relations with the West which enabled them to procure cassiterite, which when mixed with copper rendered it harder. The ancients were not acquainted with tin; Pliny calls it *plumbum album*, and the *nigrum* was common lead; but the oxide of tin, or white-lead, was known to give firmness to copper, and to enable a fine cutting edge to be given to weapons of this metal. We hope that new discoveries may throw light on the relations of Egypt with England. In speaking later on of amber and of the Minoan religion I shall point out that Crete was in communication with the West from the beginning of the copper age. This new and important branch of the study of Mediterranean civilisation deserves the attention of the student. The subject of Celtic tin was discussed by the Academy of Science in Paris,[2] and to the arguments drawn from the science of geology, Salomon Reinach[3] urged one argument of great weight, which would seem decisive. The word *kassiteros* passed from the Greek into Sanscrit and into the Assyrian language, and we cannot therefore admit that tin could have come from India, for the name of the Cassiterides Islands was accepted to indicate tin in Sanscrit.

The suggestion which goes furthest in removing all doubt on the question is that we know the road followed by the caravans

[1] In 1907 Henri de Morgan found in a prehistoric tomb at Adimieh on the Nile a smooth copper axe, identical with those which are common in the copper age in Italy (*Révue de l'École d'Anthropologie de Paris*, 1908, xviii. p. 133).

[2] *Comptes rendus*, 1886, p. 247.

[3] S. Reinach, "L'Étain celtique," *L'Anthropologie*, 1892, p. 276; "Un nouveau texte sur l'origine du commerce de l'étain," *L'Anthropologie*, 1899, p. 397.

bringing English tin through France to the mouth of the Rhone at the end of the neolithic period, while no trace of any trade in tin has so far been discovered in the East.

In the present state of archæological science the priority of Egypt over Crete is absolute as regards copper and bronze, both as to the date of introduction and the perfection of craftmanship, but we must be prepared for new discoveries and ready to promote research. Let us hope that other directors of museums will follow the example of M. Maspero, who gave me for analysis some pieces of the most ancient Egyptian bronze now known.

CHAPTER IV

THE EXCAVATIONS BENEATH THE MINOAN PALACES OF PHÆSTOS

I. EARTHENWARE AND A HUT FLOOR

IN order to find out what was beneath the foundations of the Minoan palaces on the hill of Phæstos I excavated down to the virgin soil. My companion in this exploration was Dr. L. Pernier, to whom I owe the most grateful thanks for the help he kindly gave me in the excavations of the Italian Archæological Mission. We knew by former experiments[1] that we should find strata of the period of neolithic habitation, and that these strata were of remarkable depth.

Fig. 28 represents the western side of the palace of Phæstos. In the foreground stands the courtyard of the most ancient palace, which served as the pit of the theatre.[2] In the centre of the illustration we see the basement of the palace, made of great rectangular stones; above this is a terrace, and then the walls of the second palace. On the left the great staircase leads to the vestibule, beneath which were the magazines with the splendid painted vases in the Kamares style. Having taken up the pavement at A we dug a pit 2 metres 10 centimetres in width, 4 metres 20 centimetres in length, and 5 metres in depth, of which I reproduced a photograph in the "Palaces of

[1] *Rendiconti R. Accademia dei Lincei*, vol. xvi. June, 1907.

[2] A. Mosso, *Palaces of Crete*, p. 311, Fig. 153.

FIG. 28.—PALACES OF PHÆSTOS, WEST VIEW.

A, B, points where deep pits were sunk.

Crete."[1] At the depth of 1 metre 80 centimetres from the pavement I found the foundation of a hut, upon which was a large vertebra of a whale,[2] and I was much impressed by the fact that these primitive folk were interested in natural history. The floor of the hut was made of red clay above 10 centimetres in thickness. We uncovered about 8 square metres, but could not isolate the whole circumference lest the sides of the pit should give way owing to their unsafe condition. On analysing this fine and hard earth in my laboratory I found that it consisted of carbonate of lime and clay. I wondered if it might not be a deposit of clay for pottery, but the presence of a large proportion of carbonate of lime convinced me that it was really the floor of a hut. A similar stratum could not have been brought there by a flood, because it was too homogeneous and so hard that it seemed to have been beaten. That it is a hut foundation seems to be proved by the fact that above it was found charcoal, and below it the earth was dark in colour and of greasy consistency, as is usually the case in neolithic soil formed of human detritus. The charcoal above the foundation of the hut was probably the remains of the roof and the poles which would enclose the dwelling. All organic substances and wood had disappeared, and there is no trace in these deposits of any construction of squared stones or of walls built without mortar. Beneath the hut foundation, at a depth of 20 centimetres, was a stratum of ashes and small coal, which possibly marked the hearth of another and more ancient dwelling.

We found also horizontal handles of black pottery, semi-

[1] A. Mosso, *Palaces of Crete*, p. 23, Fig. 4.

[2] Length, 0·18 centimetre; circumference, 0·78 centimetre. Vertebræ of whales have been found also in the neolithic caves in Liguria—*e.g.*, that found by Father N. Morelli (*Resti organici rinvenuti nella Caverna delle Arene candide*, Genoa, 1891, p. 46). Father Perrando also found bones of whales in the Caverna della Matta in the Finalese, and Signor E. Rivière found the same in the Grotta dei Balzi rossi. One may conclude from these facts that the neolithic folk were in the habit of carrying home pieces of the skeleton of a whale when cast up by the sea.

circular in form and perforated vertically, bones of sheep, shells of *pectunculus*, and with the black pottery other pieces of bright pottery, chestnut in colour.

At a depth of 3 metres we found a small vase, Fig. 29, which is rather less than the actual size; it is of elegant shape, with two knobs below.[1] The clay is red and granulated, with white specks, and is well baked. The elegance of its shape proves the artistic sense of the population who dwelt on this hill.

In the articulation of the foot there is a cuboid bone, termed *astragalus*, used by the ancients for play, like dice, and also for purposes of divination. For the latter reason they are often found in sacred places.

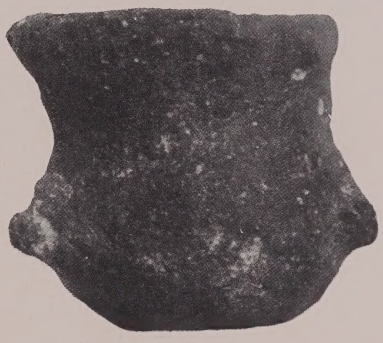


FIG. 29.—SMALL VASE OF RED CLAY FOUND IN PIT A AT A DEPTH OF 3 METRES.

Fig. 30 shows some astragali of oxen and sheep from the excavations of Phæstos. I found some at Cannatello, near Girgenti,[2] in a cultus site, and this is important, for astragali were used in the neolithic period, and are connected with the primitive Italic religion, which accounts for their being discovered in great numbers near the *Lapis niger* in the excavations of the Roman Forum.

Bone prickers made from the fibula of a sheep, and a large smooth spatula, possibly cut from the scapula of an ox, were also found. Bones of the sheep, hare, wild boar, and ox, probably the residuum of the food of the inhabitants, were very abundant, but I found neither bones nor teeth of horse or dog. The fact that the heads of the femura and tibiæ, and other spongy bones, were found intact among the detritus, suggests that no dogs lived near

[1] To avoid repetition, I here state that this vase, and all the pottery successively described here, is hand-made without use of the wheel.

[2] A. Mosso, *Monumenti Antichi*, xviii. p. 88.

these huts, otherwise these bones, which are so tempting to dogs, would have disappeared.

Fig. 31, B, is one of the commonest types of rounded or sharpened spatula, and was probably used by the potters. Other sharp prickers (Fig. 31, C, D, E) are needles for sewing skins. F, a triangular implement of bone broken at the base, is made from the perone of a large ox, and probably served as a weapon.

FIG. 30.—KNUCKLE-BONES FROM OXEN OR SHEEP DISCOVERED IN THE NEOLITHIC SOIL OF PHÆSTOS.

Among the bones which came to light are some of great birds; I saw some with the articular extremity blackened, which fact gives reason to suppose that the birds were roasted on a spit. Two of these bones, which were probably femora of great birds, were carved. One, which was well polished, Fig. 31, G, with the extremity hollowed out like a funnel, is probably the pipe of a bagpipe. Dr. Piette[1] has already published similar pieces of

[1] Déchelette, *Manuel d'Archéologie préhistorique*, p. 202.

FIG. 31.—IMPLEMENTS OF BONE DISCOVERED IN THE EXCAVATIONS OF PHÆSTOS.

bone, cut like the graduated pipes of the characteristic instrument of the god Pan, which is still used by our own shepherds. Another piece of a femur, carved like the mouthpiece of a bagpipe, was found broken, and we may therefore be sure that these people amused themselves with music. Very interesting is a fragment of unworked ivory (Fig. 31, A) taken from the base of an elephant's tusk, and testifying to the relation of these neolithic men with Africa.

2. NEOLITHIC FIGURE AND SHELLS

The most important object that came to light in this excavation is a small figure of unbaked clay, which I found at a depth of 4 metres (Fig. 32). It was published in my preceding volume, but I reproduce it here, as in this photograph a mark resembling a cross on the right side is more visible. It is difficult to decide if it is a scar such as we constantly see on savages, and we will return to the subject later. The head is missing—it must have had a long neck which fitted into a cylindrical hole hollowed out in the trunk between the shoulders. This idol has three openings on the right shoulder, which probably served for securing the head in place or for the attachment of ornaments. The stump at the shoulder is smooth and without arms, as is the case with all the neolithic idols of Knossos.[1] The bust is well developed and the right breast is of hemispherical shape. The abdomen is

FIG. 32.—STEATOPYGOUS IDOL OF UNBAKED CLAY, DISCOVERED IN PIT A, 4 METRES BELOW THE SURFACE.

[1] The figure is shown a little less than the actual size. To save repetition I will say here that all the figures of which I do not give the dimensions are also rather less than the actual size.

strongly protuberant, and below it the mount of Venus is marked by a deeply incised line in the shape of a triangle. The enormous development of the posterior part in this female figure caused me to write a chapter on fat women.

Near this idol was a piece of magnetic iron weighing half a kilogramme. We may suppose that this was a cultus object from the fact that it had never been used as a hammer, though from its shape it might have served for that purpose. I know no more ancient specimen of iron.

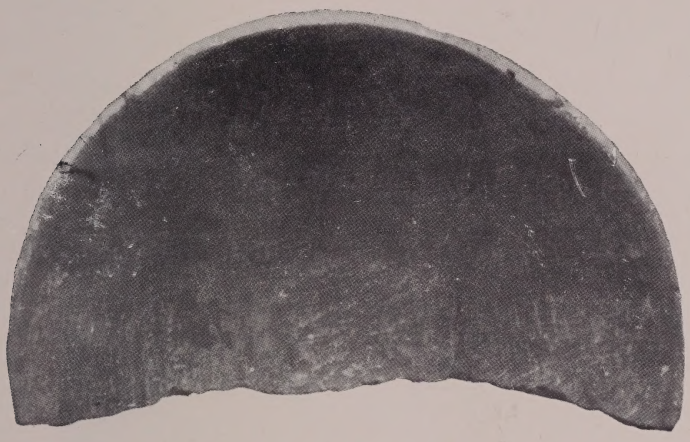
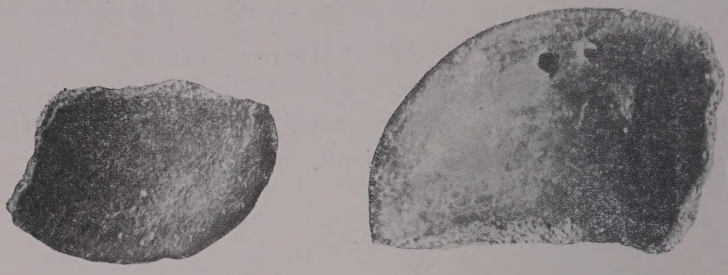


FIG. 33.—SMALL DISH OF BLACK SHINING EARTHENWARE, POSSIBLY USED FOR RELIGIOUS OFFERINGS.

That the place where the piece of iron and the small female idol were found was a sacred place, we may argue from the finding there of some little dishes (Fig. 33) for offerings, or for use in some rite; for these plates were too small for practical use, like the little platters shown on Fig. 34. On the plate B are two holes near the edge, which would serve for hanging them up by. At Hissarlik, too, in the earliest city, there were abundance of cups and vases so small that they were surely cultus objects. I am led to this conclusion through having found here a shell of *pectunculus*, which had the convex part scraped off to allow it to stand on a flat place (Fig. 35). Shells of *pectunculus* are

found so abundantly in the neolithic soil of Phæstos that they must have had some special significance (Fig. 36), otherwise we can hardly understand how, among all the beautiful shells



A B

FIG. 34.—FRAGMENTS OF NEOLITHIC RITUAL DISHES.

which could be collected on the seashore, only those of the *pectunculus* should have been brought home, though certainly the pinky colouring gives this shell with its concentric whorls

FIG. 35.—"PECTUNCULUS" SHELL WITH THE CONVEX PART WORN AWAY.

round the hinge a very beautiful appearance, but this is hardly a sufficient reason.

At one time it was believed that these shells were worn as necklaces, because in some of them there is a perforation (Fig. 36); but many of these shells when picked up on the

seashore have a hole, which has been made by the friction of pebbles and sand on the most salient point. In Fig. 36 I reproduce a series of these shells, some perforated and others whole; several of them are much worn, and from this fact we may be sure that these molluscs were not eaten. The cultus use of shells appears evident on the altars of Knossos,

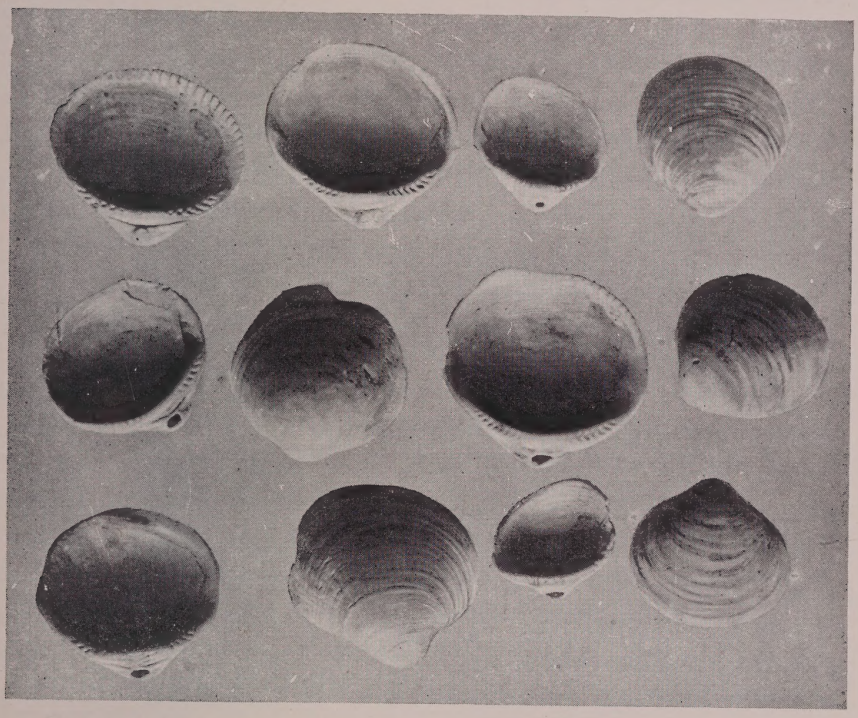


FIG. 36.—"PECTUNCULUS" SHELLS DISCOVERED IN THE NEOLITHIC SOIL OF PHÆSTOS.

as published by Dr. Evans, where the shells of *pectunculus* and *cardium* were found with a coloured pattern on them.

The appearance of these same shells in the neolithic soil of Italy is an important point, and I have published a photograph of the *pectunculus* shells which came to light near a sacred spot in my excavations at Cannatello.[1] I have also found other

[1] *Monumenti Antichi*, p. 646.

shells at Caldare and on the Pulo, near Molfetta, which are identical with those of Crete.

Perhaps it was the custom on undertaking a sea voyage to pick up a shell on the shore and to take it as an *ex voto* to the divinity, or to take it on the return from a journey and to offer it with prayer and thanksgiving for a successful voyage. At the time when pilgrimages were made to Palestine, a shell was the sign of the voyage made across the sea. The same shells of the *cardium*, which is too small to drink from, were fastened to the pilgrim's cloak; this is the same sacred sign revived by people who have crossed the Mediterranean Sea, and this custom from the neolithic age reached that of the Crusades, and the shells served later as a souvenir to the pilgrims who visited the sanctuaries of Spain and Italy.

3. SHAPES OF THE NEOLITHIC VASES [1]

The most ancient neolithic vases are of globular form or have the base slightly flattened; they are simple basins or dishes, scarcely differing in profile from our common earthenware. I will say at once that in all my researches I never found any fragments of pan or any kind of vessel blackened by smoke of which I was certain that it had been used for cooking on the fire. It seems therefore as if cooking could not have been done over the fire in these vessels. The vases were of decorative pottery, made to hold dry things or liquids, not to be put on the fire, since no trace of soot has been found on the outside. Fragments similar to that shown in outline (Fig. 37) are found in various sizes, made of red or black clay and polished.

The neck forms a simple edge or a light upright border, above 1 centimetre in height, as in the vase (Fig. 38), of which the neck is about 10 centimetres in diameter, and which is decorated with two incised lines, filled with a white sub-

[1] I published a detailed description of these vases in *Monumenti Antichi*, vol. xix. 1908, p. 573, and only repeat here the most important points for a knowledge of the surroundings in which these peoples lived.

stance. The piece below is of exactly the same quality of clay, and is black also, and belongs, I think, to this vase. Even at the present day many savage peoples use spherical pots, which stand upright more easily when placed on uneven ground. In the huts there may have been rings of straw or wood upon which these globular vases would rest, and in Egypt there existed elegant supports of pottery or metal on which the vases could stand. Other vases, which I do not illustrate, were spherical in shape, with a cylindrical neck, having

FIG. 37.—SECTION OF A NEOLITHIC VASE.

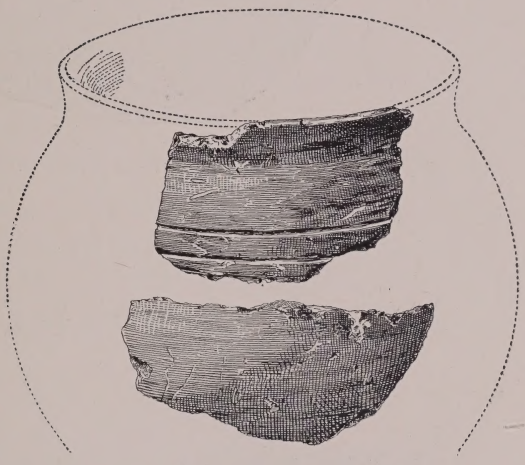


FIG. 38.—NEOLITHIC VASE RECONSTRUCTED FROM TWO FRAGMENTS.

the diameter about equal to the radius of the vase. The neck is sometimes about half or one-third the length of the whole vase. These forms were found in abundance by Dr. Schliemann in the first and second cities of Hissarlik, and, with handles of various shapes, fixed at different heights, remained in use through the bronze age till the beginning of the iron age.

The fragment (Fig. 39) came from a large vase which probably had a globular base. I tried to complete it (Fig. 40) by adding another piece found near by. The sloping neck is 5 centimetres in height and polished inside, proving the ability of the potters of the neolithic age. Others of the same shape

FIG. 39.—FRAGMENT OF A VASE WITH GLOBULAR BASE.

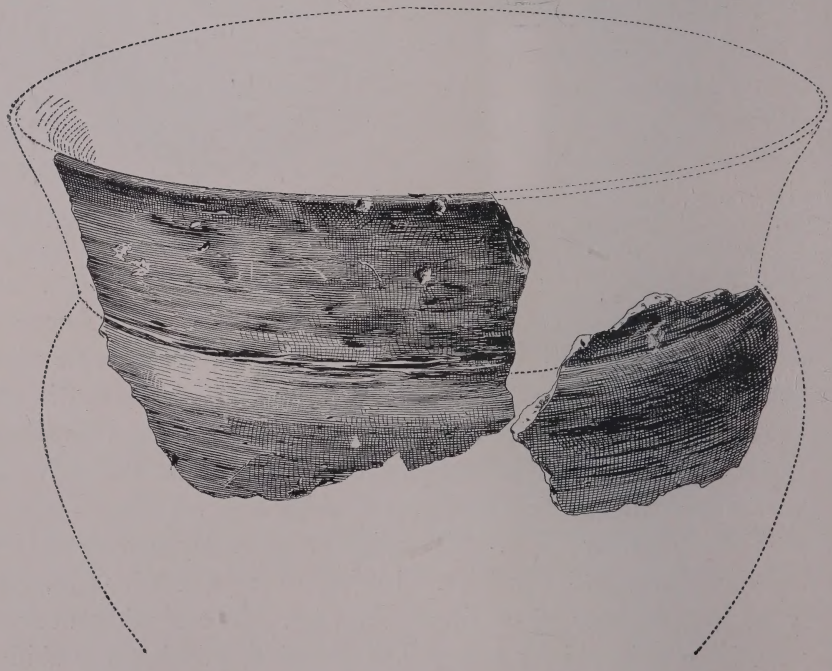


FIG. 40.—VASE RECONSTRUCTED FROM TWO FRAGMENTS.

are smaller, of black clay, with the inside of the neck also polished.

Plates of various sizes, both fine and coarse, are common. Then come porringers, with flat base and curved edges, with the

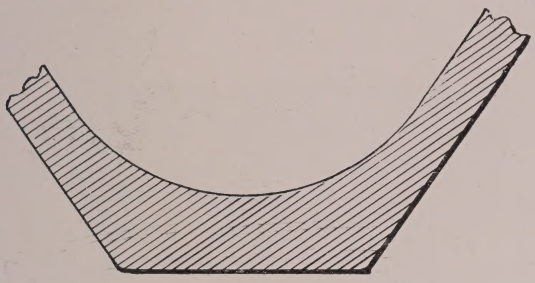


FIG. 41.—SECTION OF BASE OF A NEOLITHIC VASE.

convexity outside, resembling our modern basins, and large vases, of the form of which Fig. 41 shows a fragment, shaped like our ordinary flower-pots. They are both large and small, fine or coarse in texture. Fig. 42 is shaped like a stewpan, except that

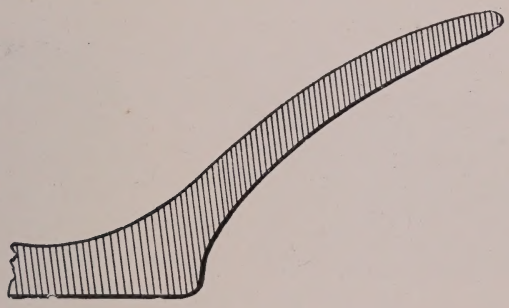


FIG. 42.—SECTION OF NEOLITHIC BOWL.

the sides are sloping and form a slight sabot at the base. Some fragments have a foot, which stands separate at a right angle like a cylindrical ring. Somewhat more numerous than the black sherds are those of smooth red clay marked with a bright incised line. Some vases have nipple-shaped or oval

knobs ; a similar decoration is seen in the bowl (Fig. 43), which has two projections close together. This bowl, whose diameter is 15 centimetres at the top, is made of well-baked black clay, and is very thin and polished externally, but not in the interior.

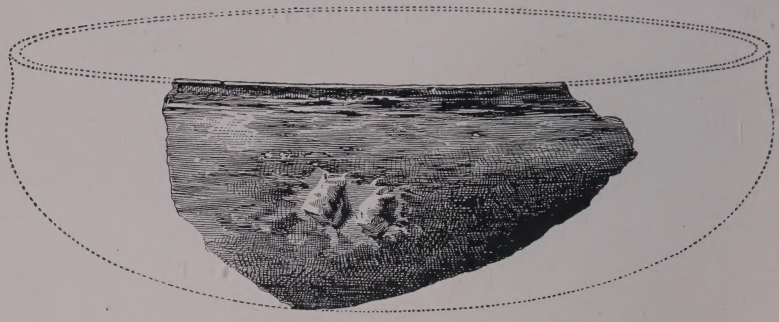


FIG. 43.—BOWL RECONSTRUCTED FROM A FRAGMENT.

I found other fragments with similar rounded projections, 2 centimetres in length and half that in breadth. These are the earliest attempts in the neolithic age at a style of decoration which later on became very common in all countries. Those

A B

FIG. 44.—TWO BASES OF NEOLITHIC BOWLS OF BLACK LUSTROUS EARTHENWARE. A, SIDE VIEW ; B, SEEN FROM BELOW.

who have had no experience of fitting together fragments of pottery will not easily understand the beauty of the restored vases. There were trays with a low rim, and shining dishes, black as ebony, resembling our dessert dishes. Fig. 44 shows

two feet (one in profile, A) on the upper edge of which the dish stood horizontally. The circular piece, B, near it is the base of a foot, seen from below, slightly concave and showing the marks of the stecca. Some of the dishes instead of being black are drab or brown in colour, and worked with great care, and, like the little hollow feet (Fig. 45), are also polished

FIG. 45.—BASES OF BLACK NEOLITHIC BOWLS.

with the stecca. On other vases there is an incised design of parallel furrows which give the impression of waves on the water. This is a common design in the neolithic age, both in Italy and Crete, and was described by Dr. Mackenzie.[1] I give later on an illustration of similar pieces found at Knossos (Fig. 56, No. 12).

4. THE PROGRESS OF THE ART OF POTTERY IN THE NEOLITHIC AGE AND POLISHED BLACK WARE

Except in the case of Egypt pottery is our only guide in the study of neolithic civilisation. The objects of wood and leather and the clothing have all disappeared in the destruction caused by damp and weather and the lapse of time. Only the implements of bone and stone and the terracotta vases have remained. The walls are very rare and without mortar, and even bricks are late in appearing. Modelling and design had their first expression in pottery, and by means of this we can follow the progress of the people in their first steps towards civilisation. Hermeneutics,

[1] Mackenzie, "Pottery of Knossos," *Journal of Hellenic Studies*, vol. xxiii. p. 176.

or the art of interpreting texts, can be practised on sherds, for we have no other documents. Written information would doubtless be clearer, but for periods so remote historical text is hardly to be expected. The reader will gradually be convinced that pottery, well interpreted, can give reliable testimony.

A plastic material like clay is not alone sufficient for pottery, for it loses moisture in drying and contracts. It is necessary to add something to the clay to prevent the vase from breaking after it is made. The firing of pottery presents another difficulty, for if the clay is very greasy and tenacious, it does not keep its shape, but cracks in the furnace. Some substance had to be mixed with the earth to render it porous, so that the vapour from the water could escape easily. The potters of the neolithic age had discovered that by adding powdered carbon to the clay this effect was obtained. Henceforward black pottery was not a caprice of fashion but a technical necessity ; the desire also to make earthenware vessels which would be lighter and more elegant than those of clay must have contributed to make this method general. After having learnt to polish the surface of the vases by burnishing with the bone or smooth stone spatula, the potters observed that when these black vases were placed in the flame or upon hot coals they became red in the parts where the fire was hottest ; to avoid producing these red, yellow, or drab marks, which were the effect of firing by an open fire, they discovered how to bake fine pottery so that it was bright and black as ebony. To obtain a perfect degree of firing and keep the internal and external superficies of the same intense black without marks it was necessary to heat the vases of black earth to a high temperature without allowing them to come in contact with the flame or with a current of heated air. The closed ovens are now called muffle furnaces. A microscopic examination convinces me that the potters of the period in question were skilful enough to wash the clay and remove the most soluble part by means of water, so homogeneous and fine is the appearance of the substance. In the paste of the coarser vessels we find

fragments of quartz, mica, or granite, which were used as well as sand to diminish the plasticity of the paste and make it more resistant to the fire. We may therefore conclude that the fundamental technical processes of the ceramic art were discovered in the neolithic age, including the use of a fat solvent or cement; and that the use of ovens shut off from the fire was already known from the neolithic period. All trace of this progress of the ceramic art in prehistoric ages had been lost in both literature and archæology, and the name of Etruscan *bucchero* was given to

FIG. 46.—CONICAL BOWL OF BLACK LUSTROUS EARTHENWARE.

a similar kind of pottery which came into vogue in Etruria. But as these vases of fine and polished black earthenware were found in other parts of Italy, and in shapes differing from those of the Etruscan vases, it was allowed that another kind of *bucchero* existed, and it was termed *Italic*.

Now we see that *bucchero* was already made by the Cretan potters some thousands of years before it was known in Italy, and later researches must decide if this invention was first made in the Aegean or in Egypt.

Fig. 46 represents one of these conical vases of polished black earthenware restored from three pieces. The illustration

is two-thirds of the natural size. A handsomer but similar conical vase, with horizontal grooving parallel to the edge, now in the Prehistoric Museum at Rome, shows the perfection of this pottery.

Fig. 47 is important on account of its incised decoration. It is a piece of well-fired earthenware 1 centimetre thick, red-brown in colour, smooth inside, and is part of a large cylindrical vase. The decoration seems to be made with the nails. The

FIG. 47.—PIECE OF NEOLITHIC POTTERY WORKED WITH THE NAILS.

thumb and forefinger pressing upon soft potter's earth produce a similar angular mark. The arc of the curve corresponds to that of human nails, and the protuberance of the clay between corresponds to the two curvilinear impressions, making it appear probable that this decoration was really made by the nails. This identical pottery has been found in neolithic soil in Italy ; and we need hardly point out with regard to the study of neolithic pottery on the Continent, the great value of the discovery in Crete of the same forms of vases, with the same decoration, in strata of which we are more or less acquainted with the

chronology. In the pit B came to light fragments of well-fired red pottery with incised decoration in shining lines. Of this clay, which was probably first coloured in deep Pompeian red and then polished with the spatula, there are fragments of large cups and globular vases.

At the depth of 5 metres I found one piece with a narrow handle set on vertically near the edge of a vase of cylindrical

FIG. 48.—POTTERY DECORATED WITH RECTANGULAR DEPRESSIONS, FILLED WITH A WHITE SUBSTANCE.

form (Fig. 48). The surface was decorated with rectangular depressions, in which the white substance is seen. This is a type of decoration which we shall find very common in the neolithic pottery of Italy. We may, in fact, be certain that all the forms hitherto believed characteristic of the neolithic age on the Continent are also found in the neolithic soil of Crete.

Fig. 49, half-size, shows an almost intact basin of brown

clay, well fired and polished on the surface. There are similar basins with two handles. The advanced state of the potter's art is evident from the attempts at decorating earthenware with figures. After removing the pavement in one room a piece of coarse polished earthenware (Fig. 50) was found on the surface of the neolithic soil. It is 5 centimetres in height, and represents a human face with a long neck, the mouth open, the forehead retreating. This figure was probably fixed on the edge or body of a vase. One of the commonest motives of the Minoan or

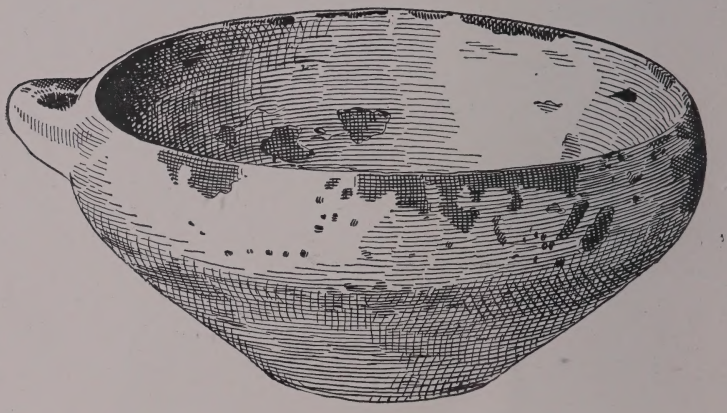


FIG. 49.—BOWL OF BROWN CLAY.

Mycenæan age for the decoration of two handles was a human or animal figure.

From the form and position of the handles, which are all curved and fixed, we may argue that neolithic vessels were not placed on the fire for the purpose of cooking or heating the food. I have seen no handle placed at a right angle as in our cooking pots. The form and the place where the handles are fixed vary much, as also their number ; often there are two close together, with a very small vertical opening, through which a cord could only pass with difficulty. Horizontal tubular handles, so common in southern pottery of the neolithic age, were also found at Phæstos. Generally speaking, handles for vertical suspension by means of a cord, like those seen at Hissarlik, are most

prevalent. This makes one think that most of these vases were for ornament and were kept hanging up in the huts.

Two narrow handles are so fine and so well worked with projecting knobs that one is tempted to consider them as imitations of metal vases, yet we are certain that these elegant forms are found at a period anterior to the knowledge of metals. As an example, I refer to Fig. 51, which belongs to a vase of *bucchero* decorated and burnished by the stecca.[1] I found one handle made like a human nose attached to the edge of a cup, and

FIG. 50.—VASE HANDLE IN THE SHAPE OF A HUMAN FIGURE.

FIG. 51.—HANDLE OF A POLISHED BUCCHERO VASE.

the two vertical holes for suspension were, perhaps, intended to represent the nostrils.

5. DECORATION OF THE NEOLITHIC POTTERY OF PHÆSTOS

One of the most important things (in my opinion) which came to light in my excavation beneath the foundations of the

[1] Similar handles, which certainly belong to the neolithic age, were found in the excavations of the Pulo. I quote as an example Fig. 66 in the account published by Mayer (*Le stazioni preistoriche di Molfetta*, Bari, 1904). Similar handles, but wide and flat with small vertical ears surmounted by a button, were found on the hut foundations at Reggiano and at Monte Bradoni (*Bull. paletn. ital.*, xxv. 1899, p. 306).

palaces of Phæstos was the discovery that even in the neolithic age the Cretans had learnt the art of giving colour to their pottery by a decoration of red and brown lines. I will not delay

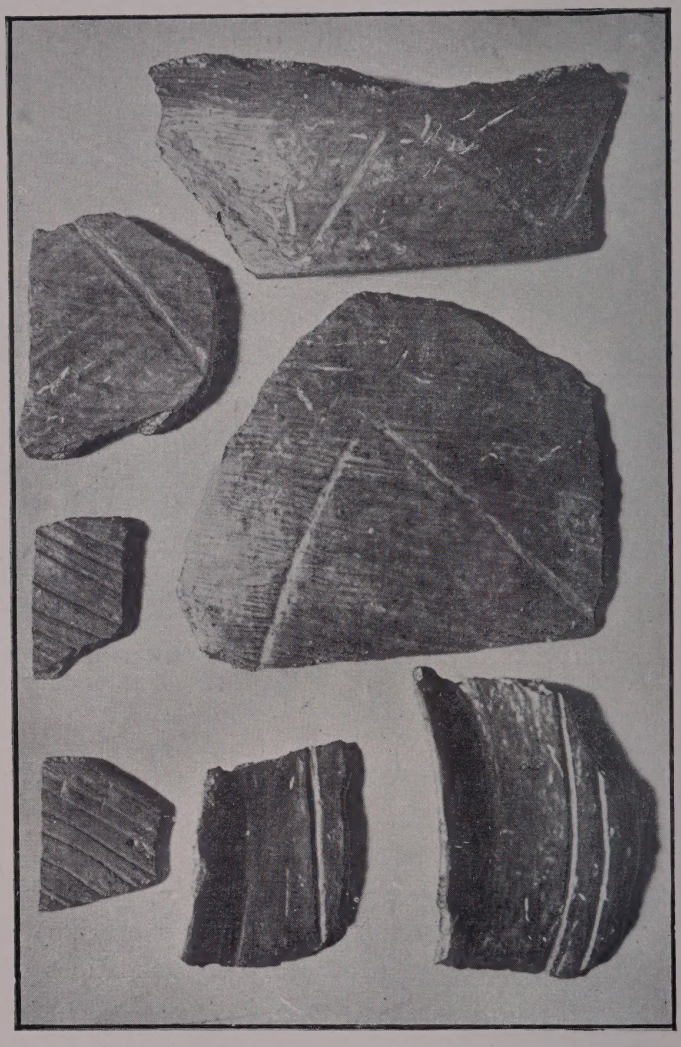


FIG. 52.—FRAGMENTS OF POTTERY, WITH INCISED LINES FILLED WITH WHITE SUBSTANCE.

to discuss this question, which I have treated in a special article with coloured plates, and I refer to that work any who may desire fuller information on the origin of neolithic coloured

pottery.[1] The absence of curvilinear design in the neolithic pottery at Phæstos and Knossos is also a noteworthy fact. Curved lines and semicircles came into fashion in the first Minoan period, as we shall see later.

In Fig. 52 are reproduced some fragments of black and

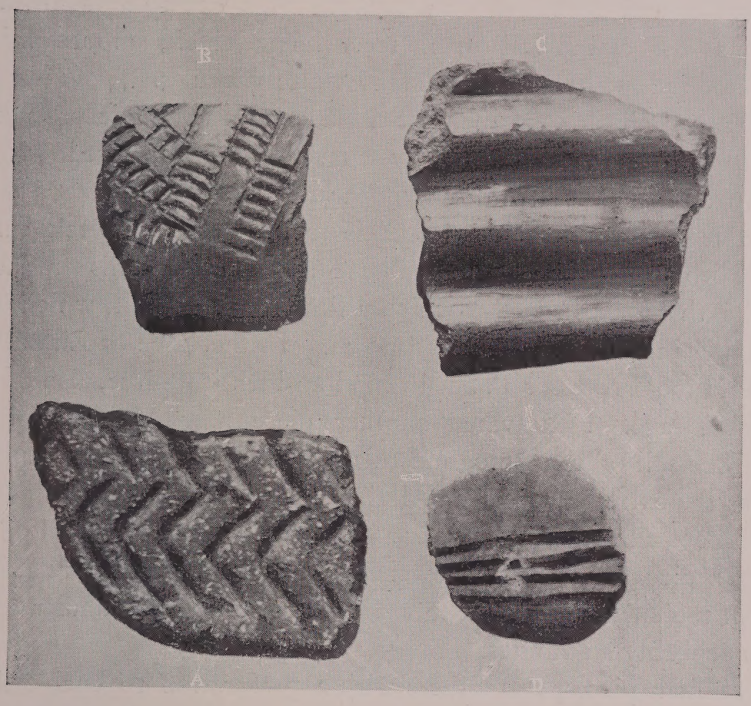


FIG. 53.

A—Linear design impressed on the pottery with a stamp.
B—Fragment of a black vase with incised lines.
C—Ribbed decoration of a vase.
D—Disk of painted earthenware.

yellowish-brown earthenware with a design of simple incised lines. The first design on the right is made of broken lines on the neck of a polished vase, nut-brown in colour. On the other pieces the lines are parallel and filled with a white substance.

[1] *Monumenti Antichi*, vol. xix.

Sometimes, as in the case of the two upper pieces on the left, the decoration was made of simple parallel incisions.

In the fragment A, Fig. 53, a stamp has been used to make lines, which are bent at right angles. An identical design appears on a vase from the *tholos* of Haghia Triada.[1] This primitive technique was greatly developed in the neolithic pottery of Matrensa and Stentinello in Sicily. This example is from a recipient of cylindrical form, 1 centimetre thick, smooth inside, made of yellowish earth with many white granules.

Fig. 53, B, is a fragment of a black cup. The decoration is made with a series of slightly curved lines impressed with a stamp and enclosed within two parallel lines.[2]

The next piece (Fig. 53, C) is from a vase of black earth, with brown marks, polished inside and out.[3] This fragment marks the earliest date at which a similar decoration, which was common in Southern Italy, is known. In the Cave of Zinzulusa, near Castro, Professor P. Stasi found an identical piece, also of the neolithic age. I excavated another piece near Molfetta in the neolithic soil of the Pulo, and this type of decoration is found as far as the extreme confines of Italy in the valley of Susa.[4]

The disk (Fig. 53, D) has been cut round by small blows from a piece of yellowish earthenware decorated with red lines. From the curve it is evident that it belonged to a globular vase; it is probably an amulet.

Similar pieces, and others with a perforation to enable them to be hung round the neck, were found at Matera, in the Caverna delle Arene Candide in Liguria; at Coppa Nevigata, near

[1] *Memorie Istituto Lombardo*, xxi. 1900, Plate IX. Fig. 21.

[2] The same decoration, with smooth rectangles alternately with other rectangles filled with impressions, is found at the neolithic settlement at Butmir in Bosnia (*Die neolithische Station von Butmir*, Wien, 1895, Plate VI. pt. 1).

[3] The ribs are 15 millimetres apart in a horizontal direction, the piece belongs to a large cylindrical vase.

[4] The neolithic station of Rumiano di Vayes in Val di Susa, described by Taramelli (*Bull. paletn. ital.*, ix. anno xxix. p. 129). In Plate IX. Fig. 4 is a representation of a piece like this.

Manfredonia ; and in Egypt.[1] This testifies to the psychological relationship which connected all the peoples of the Mediterranean in the neolithic age, though we do not know why they should have chosen a fragment of a vase to make a disk of.

6. STONE AXES, KNIVES OF OBSIDIAN, OBJECTS OF BONE

In the neolithic soil of Phæstos were found the three stone axes of Fig. 54. They are oval-shaped flints, sharpened on one side to give a cutting edge, and with the other end left rough where it would be fixed on the handle.[2] Fig. 54, B, struck me as having been worked obliquely on purpose to give an inclination to the head and enable it to cut better, as is now done with hatchets. Later on, stone axes were polished on both ends and are better worked. In Crete these axes are less common, but have been found.

Flint weapons are very rare in Crete, and I only saw two arrow-heads in the museum at Candia. On the other hand, knives of obsidian are very abundant. In Fig. 55 I show some of these knives and scrapers. The great numbers in which they appeared in the excavations make me think that they were used for working or carving wood, but unfortunately all the objects of wood have disappeared and we can only conjecture as to the decoration of the huts when we see the progress made by the ceramic art. These knives cut so well that during the excavation I always kept one in my pocket to cut my pencil point. They were imported from the island of Melos, which is very rich in obsidian.

Among the ruins of the primitive palace of Phæstos we had proof of the skill of the Cretans of the neolithic age in working stone, and in piercing the axes in order to fasten them to the

[1] This question is discussed in my article on "La Stazione di Coppa Nevigata, presso Manfredonia," *Monumenti Antichi*, 1909, to which I refer any reader who desires further information on the subject.

[2] A, on the left, is 91 millimetres in length and 40 millimetres thick in the middle.

handle, besides making double axes. In a niche we found some pieces of polished stone, fragments of broken axes ; and amongst these a round piece of very hard green stone, about the size of a

FIG. 54.—STONE AXES FOUND IN THE NEOLITHIC STRATA OF PHÆSTOS.

common cork. To make a hole in an axe they used a cane and some sand and water. The cane was spun round quickly and the stone was pierced by it with the help of the sand, and a circular hole was made. When half through, the stone was turned and the drilling recommenced on the opposite side. In this cylindrical

piece of stone we see proof of the great skill of the Cretan workmen, for the two openings meet almost exactly with a lateral displacement of only 2 millimetres. When the first palace of Phæstos was built, the age of bronze was reached, the age of

FIG. 55.—OBSIDIAN KNIVES.

copper was past, and probably no flint weapons had been made for centuries. The sight of these useless fragments collected in a niche of the early palace convinced me that the tradition of the neolithic age was not spent and that the cult of the ancestor was still alive.

CHAPTER V

ANTIQUITY OF THE NEOLITHIC POPULATION OF CRETE

I. DIFFERENT KINDS OF CLAY USED FOR VASE MAKING

HOW long did this people live on the hill of Phæstos before the use of copper and bronze? The answer is found in the studies of Dr. Arthur Evans at Knossos, and science is indebted to him for the foundation of prehistoric chronology.[1] For the history of Mediterranean civilisation this is a question of the greatest importance, involving as it does the whole subject of prehistory, for if we succeed in establishing a date for Crete, we have a guide to the chronology of the other parts of Europe.

Let us again glance at the pottery to study its evolution, and make a few comparisons.

Up to the present no tombs have been found in Crete of which the contents are exclusively of the neolithic period. The *tholos* of Haghia Triada (possibly the most ancient Cretan tomb yet known) belongs to the copper age, and contains fragments of pottery identical with that of Phæstos. The clay is red, yellowish, or whitish, and there is no black polished *bucchero*. An examination of the pottery of Phæstos shows that in the neolithic period vases were made of three different qualities of clay. A red clay, more or less purified and washed, which is the common clay produced by the decay of crystalline rocks, with a mixture of

[1] A. Evans, *System of Classification of the Successive Epochs of Minoan Civilisation.*

small grains of other substances and spangles of mica, quartz, and sand; it takes the characteristic red colour from oxide of iron. A second kind is composed of the same clay mixed with pulverised carbon; and of this were made both fine and coarse vases, which in the firing pass from yellow to red, while keeping on the inside traces of the original black paste. I have assured myself that this black substance is really carbon by burning some in a tube for analysis, from which I obtained carbonic acid. Thirdly, a light coloured pottery was made of clay which contains no iron; it is a compost of silex, alumina, and water, whitish in colour, soft to the touch and producing an astringent sensation on the tongue. With this a red clay was mixed to obtain a pinkish shade; or, if used alone, fine vases were made of the yellowish colour like the vases which were later believed to be a Mycenæan speciality. Of this white pottery we have two qualities: one porous, which gives an astringent sensation to the tongue, the other rather greasy, which does not adhere to the tongue, and which has possibly acquired this character by being soaked with some resinous substance, which still renders the surface bright. This last is identical with the so-called Mycenæan pottery which came back into vogue about 1500 B.C.

From these facts we may suppose that the neolithic race settled on the hill of Phæstos at a less early date than elsewhere, for at Knossos no sherds of black and shining ware with the decoration of incised lines are found in the deepest strata, but when these people arrived on the hill of Phæstos they had already learned to draw incised patterns on the vases.

2. NEOLITHIC BLACK POTTERY WITH WHITE INCISED LINES

There is also a difference between the pottery of Knossos and that of Phæstos in the incised designs filled with white substance drawn on the black pottery. A portion of one of Dr. Mackenzie's illustrations (Fig. 56) makes this clear.[1]

[1] Dr. Mackenzie, "The Pottery of Knossos," *Journal of Hellenic Studies*, vol. xxiii. 1903, Plate IV.

These designs with meanders and dotted ground, this elegant decoration of bands on the *bucchero*, far surpass in richness of ornament anything on the fragments from Phæstos. The designs (Fig. 56, Nos. 15 and 16) are important, as the most ancient decorative designs on drinking-cups found in the dolmens known up to the present day. They consist of horizontal bands filled with

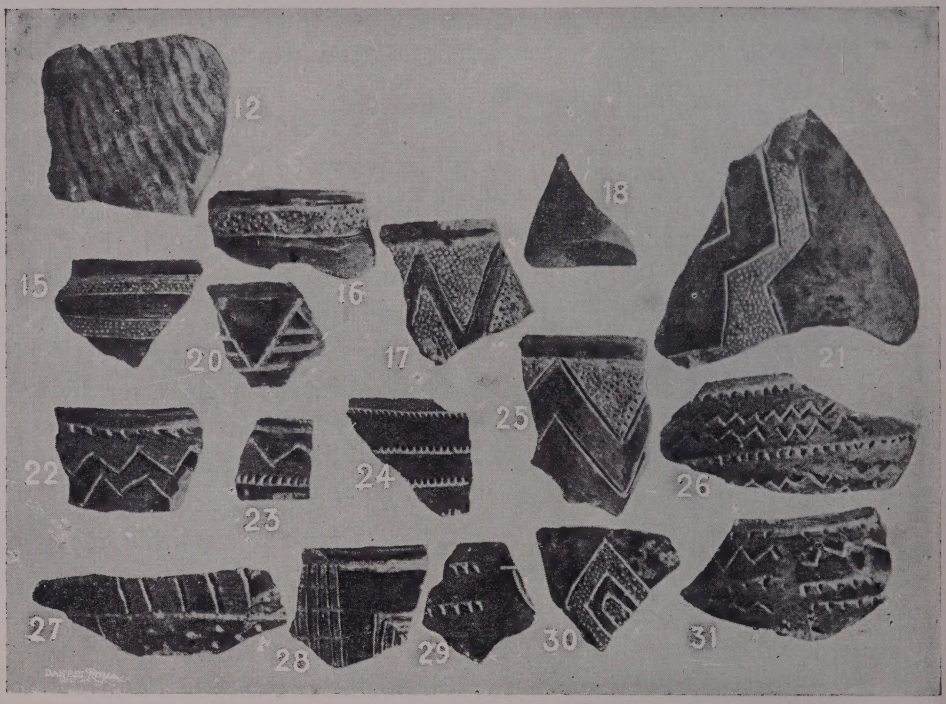


FIG. 56.—INCISED DESIGNS ON NEOLITHIC POTTERY FROM KNOSSOS.
From Dr. Mackenzie's "Pottery of Knossos."

regularly arranged dots, alternating with plain bands equally spaced.

In Chapter XV. I shall refer to an example of the most ancient drinking-cups with this style of decoration, found at Villafrati, near Palermo. The design of plain bands placed at acute or right angles, and standing in relief from the dotted ground of the vase (Fig. 56, Nos. 17 and 25), forms with the zigzag dotted

stripes as in No. 21, one of the commonest motives of continental neolithic pottery. The Greek key-pattern border in No. 30 is one of the commonest types found through all the centuries up to our own day. The resemblance of this pottery with that found by Dr. Schliemann in the first city of Hissarlik is complete,[1] but we must remember that the ruins on the hill of Troy are later than the neolithic deposits of Phæstos ; and if there were no other reason the difference in the Trojan decoration of black pottery with white lines is shown by certain undulating lines which are characteristic of an age nearer to our own times.

One decisive result of the studies of Dr. Evans and Dr. Mackenzie is that at Knossos we see the complete uninterrupted series showing the progress of the potters, who, arriving on the hill of Knossos with a red and black pottery with plain unornamented surface, were able to initiate the art of decoration by simple incised lines, which later on were filled with a white substance, chalk or gypsum. We do not know how far the potter's art was a simple imitation or how much we owe to the inventive talent of the Cretan race.

Until new discoveries are made everything must depend on the excavations of Dr. Evans, for no neolithic strata have been discovered on the Continent of which we can determine the date sufficiently nearly to be of use. For the neolithic age Dr. Mackenzie's illustration (Fig. 56) is the alphabet of ceramic decoration, for all the designs found in Europe in later ages are a repetition of these motives.

Parallel lines, zigzags, striated triangles, nail-marks in the clay, dotted border-patterns, the decoration of the bell-shaped drinking vessels, incised decorations filled with white substance, in fact nearly all the designs found on vases dating from the beginning of the bronze age back to the neolithic period have come to light in the earliest strata of the Cretan deposits.[2] In

[1] Schliemann, *Troy*, p. 266.

[2] T. E. Peet, who has written on primitive Aegean civilisation ("The Early Aegean Civilisation in Italy," *Annual of the British School at Athens*, xiii.

a paper on a prehistoric tomb at S. Angelo di Muxaro, near Girgenti,[1] I showed that the neolithic designs of Crete were in use in Sicily in the times preceding the Hellenic invasion.

We must admit that men were not savages before the introduction of the use of metals. They had a fine quality of beautiful pottery such as can no longer be found in the country. The art of the potter had made such progress in the neolithic age that the process of putting on a slip was already in use; that is, when a vase was made it was allowed to dry, and then it was immersed in a bath of liquid clay of a finer quality. By this process the surface of the vase was rendered smooth even when it was made of coarse clay.

3. CHRONOLOGY OF THE NEOLITHIC PERIOD IN CRETE

We now come to the grave problem of the age which we may attribute to the deposits in Crete. In my first pit, A, were more than 3 metres' depth of neolithic soil; in the second pit, B, we found about 5 metres of the same earth before reaching the virgin soil. At Knossos Dr. Evans found about 6 metres 43 centimetres —so thick is the layer of human detritus of the neolithic folk who lived on the hills of Phæstos and Knossos. The elevated position and the declivity of the hill prevented the accumulation of matter through floods, indeed we must suppose that a part of the detritus would be washed away by the rain. The black earth which we excavated beneath the ruins of the palaces was left there by man, and is composed of the residuum of food, of ashes and coal from the fires, of destroyed material from the huts, from all that is thrown out in the neighbourhood of a dwelling, together with the rubbish and dirt. At Cannatello, near Girgenti, in Sicily, I found similar deposits of the depth of 4 metres,[2] and the chemical analysis showed that it was a soil rich in phosphates

1906-1907, p. 416), is also of this opinion, and till we have proof to the contrary we must admit that the vases now described are anterior to the similar vases of the western basin of the Mediterranean.

[1] *Memoria R. Acad. Scienze ai Torino*, 1908.

[2] A. Mosso, "Villaggi preistorici di Caldare e Cannatello," *Monumenti Antichi*, xviii. 1908, Plate VI.

and organic matter, like that of the terremare, which had a similar origin.

The question is, how much of this black soil with the rubbish and broken crockery could accumulate in a century upon the soil of a neolithic settlement. In the present state of things, we have no certain data by which to fix the rate of increase of these deposits. The first reasonable attempt at a calculation has been made by Dr. Arthur Evans at Knossos.[1]

Upon the last neolithic stratum Dr. Evans found black polished vases. Vases of the same kind were also discovered at Abydos, and as that place was a foreign market it is supposed that the vases were brought from Crete. Besides this, there were found in the same stratum vases of the Egyptian type of the Ist Dynasty copied by the artists of Knossos. Thus there is a starting-point for the chronology of the strata of Knossos. Above these vases lies 5 metres 35 centimetres of earth below the level of the surface of the hill in the ruins of the palaces of Knossos. To this depth of accumulation Dr. Evans, according to the rule of Lepsius in Egyptian chronology, attributes the age of 5800 years, which allows an increase of 1 metre for every thousand years. Dr. Evans calculates on the same rate of increase in the neolithic soil, which is 6·43 metres in depth, and thus obtains the figure of 6000 years. At first sight the calculation of Dr. Evans seems moderate for the chronology of the neolithic period, as he attributes the same rate of accumulation of detritus to the period during which neolithic man lived in the huts and to the age during which the great palaces were built and destroyed, and in which great quantities of material would be brought thither for building purposes. In the case of the excavations of Phæstos I am persuaded that 1 decimetre is too little to allow for a century. I was convinced of this as soon as I saw the hut foundation, made of homogeneous beaten earth more than 1 decimetre in thickness, which was certainly accumulated in a few days.

[1] A. Evans, "The Palaces of Knossos," *Annual of the British School at Athens*, x. 1903, p. 19.

An examination of the bones and the manner in which they lie in the earth in a perfect state of preservation suggests the idea that the detritus formed round a hut by the residuum of food would increase more rapidly than the rate suggested. One millimetre a year is too imperceptible a layer of dust. On the sides of the pits we met with numerous strata of hearths, with ashes and coal which may have been the remains of burnt-down huts. I know not if these people kept domestic animals on the hill, but if so the stable refuse would have left more noticeable traces round the dwellings. Supposing that they lived by hunting, the boars' tusks and bones of animals are so numerous that we may be sure that they lived well. But the inorganic parts of the bones would alone suffice, with the vegetable refuse, to produce a greater depth of detritus than 1 millimetre a year. To this add the remains from household goods, clothing, pottery, which would be continually destroyed, and we must allow that 1 millimetre a year as the rate of increase of neolithic earth must be less than the actual fact.

But if one considers that the inorganic material of bones and the organic remains which accumulate round a dwelling are partly soluble in rain-water, we must reduce this rate of increase. For these reasons, therefore, when I had to decide approximately the age of the deposits at Cannatello, I reckoned the rate of increase as double that fixed by Dr. Evans.[1]

4. DR. EVANS'S CHRONOLOGY

If we suppose that a thousand years would be required for the formation of a deposit 2 metres in depth in the neolithic age, it would be incongruous to allow that in the historic period, after the Ist Dynasty, the deposit would only increase at the rate of 1 metre every thousand years. Let us, then, consider how

[1] Dörpfeld reckoned that at Hissarlik the soil had risen 10 metres in only five hundred years in the third, fourth, and fifth cities (*Troja und Ilion*, p. 32). Dr. Flinders Petrie calculated that in the case of villages built of unbaked bricks in Egypt the soil had increased at the rate of 1·27 metres in a century (*Methods and Aims in Archæology*, p. 9).

we can explain the 5 metres of remains which in the section made by Dr. Evans on the hill of Knossos lie above the neolithic soil. The pavement of the western court is 2·50 metres from the surface of the earth, and these 2·50 metres have accumulated in 3400 years; but the site was abandoned about 1200 B.C., and we do not know what effect the weather and vegetation may have had upon this hill of Knossos.

During the Middle Minoan period, in which life was most active upon the hill of Phæstos, a greater amount of remains has probably accumulated in a shorter time. As we cannot calculate what was the depth of the stratum of the ruins produced by the catastrophes which destroyed the primitive palace and the second palace, it may assist us to glance at Rome, where the studies of Lanciani are founded on a safe historical and archæological basis. We know that the villa of Voconius Pollio, at Marino,[1] which was a one-storied building about 10 metres in height, and which fell, not from violence, but from old age, in a plain which was not exposed to the disturbing action of any force, has produced a stratum of ruins 1·85 metres in depth, or more than the whole Middle Minoan period. This difference may be produced by many causes, which it would be difficult to enumerate; but the fact that a simple, one-storied country house should have produced a stratum 1·85 metres in depth, while only 1 metre to every thousand years is allowed for Knossos requires consideration.

In Rome the buildings which were erected one upon another have raised the level in a much greater degree. The maximum difference between the level of the ancient buildings and the present surface of the ground is 24 metres. At the point where the Via Nazionale cut through the Aldobrandini and Rospigliosi gardens at the corner of the Via del Quirinale in Rome, there were discovered first, the ruins of a bath of Constantine, and below it, the remains of the house of Claudius Claudianus; in a third stratum, the ruins of the house of Avidius Quietus; and finally, some primitive constructions in *opus reticulatum*. And so

[1] Lanciani, *Ruins and Excavations of Ancient Rome*, 1897, p. 99.

it is with the whole of Rome, on the hills and on the plain, little by little the level of the soil has been raised, and at so rapid a rate that in many parts of Rome this rate is twenty times higher than that accepted for the ruins of Knossos in the Middle Minoan period, which, judging from the richness and splendour of its buildings, must have been the most flourishing period of Minoan power. Certainly this superposition of buildings does not exist at Knossos, but even with regard to those which have come to light, if we take them separately, the difference is too great for us not to doubt if the rate of 1 metre for 1000 years is not less than the truth.[1]

Dr. Vollgraff,[2] who also criticises Dr. Evans's work, believes that the houses of the neolithic period, being built of wood and earth, and often renewed, would cause a greater increase of deposit than when building was of stone, and he also considers the figure of 1 metre in 1000 years too small. It is difficult to make an approximate calculation, because it would be necessary to take into consideration the removal and purification of the detritus, which would be effected at every period of rebuilding or restoration on a constantly inhabited site.

The greatest confusion comes from the discrepancy of opinion now existing amongst the Egyptologists as to the date of the Ist Dynasty. Some very competent Egyptologists consider the figure of 5800 years, taken by Dr. Evans as a base for the Ist Dynasty, too high. It is generally believed, as I understand from Professor Schiaparelli, Director of the Egyptian Museum in Turin, that the Ist Dynasty corresponds to 4000 B.C.[3]

[1] Dr. Burrows doubts if the vases of Egyptian form found in the palace of Knossos really mark the beginning of the primitive Minoan period (*The Discoveries in Crete*, London, 1907, p. 45).

[2] Vollgraff, "Das Alter der Neolithischen Kultur in Kreta," *Rheinisches Museum*, 1908, 319.

[3] Dr. E. Meyer, in a recent work on Egyptian chronology, gave a date still nearer to us for Menes, the first king of the historic period, viz. 3315 B.C. ("Aegyptische Chronologie," *Abhandl. d. k. preuss. Akademie der Wissensch.*, Berlin, 1904, pp. 1, 212).

The difference of nearly 2000 years as to which Egyptologists are now arguing, disturbs the reckoning of Dr. Evans, and for the reasons above explained I should be inclined to admit that about 2 metres' depth of neolithic soil correspond to 1000 years. This would still leave more than 3000 years for the deposits of Knossos and 2500 years for those of Phæstos. The neolithic age would, therefore, represent in the history of Mediterranean civilisation a period as long as that which divides us from the Homeric epics and the histories of Herodotus and Thucydides.

The least sound points in Dr. Evans's diagram are where the neolithic ends and where a date might be fixed corresponding to the Ist Dynasty of the Pharaohs. The incomplete character of the stratification of the latest neolithic deposits at Knossos and of the earliest Minoan deposits prevents a safe decision. As I have already said,[1] there are two points of contact with the chronology of Egypt; the first, where some of the black polished vases characteristic of the neolithic age in Crete, and, Dr. Flinders Petrie thinks, imported thence, were discovered at Abydos; the second, the vases found at Knossos resembling the Egyptian type of Abydos.

Having seen in the Museum of Turin some vases of the same shape as those of Abydos and Knossos, I asked Professor Schiaparelli, who had excavated them in the sanctuary of Heliopolis, to give me his opinion, it is as follows: "The tombs of Abydos had been ruined and disturbed, and one cannot be sure that the vases in question belong to the Ist Dynasty. The vases found in the sanctuary of Heliopolis are archaic, but I cannot say for certain that they are of the Ist Dynasty."

Dr. Mackenzie has already expressed a doubt that a stratum may be missing at the end of the neolithic period in the soil of Knossos. My own conclusion would be to fix the duration of the neolithic occupation of Phæstos at about 2500 years, while for a complete estimate of the whole period up to the Christian Era—the depth of neolithic strata in a pit at Knossos being seen

[1] Evans, "The Palace of Knossos," *Annual of the British School of Athens*, 1903–4, p. 24.

to exceed 8 metres—Dr. Evans being of opinion that at a *moderate estimate* a period of 14,000 years from the first neolithic stratum at Knossos must be reckoned, in my opinion it should be estimated at not more than 7000 years, or possibly less.

With every respect for the great authority of Dr. Evans, I should like to give a provisional character to these critical remarks till the doubtful points I have alluded to are cleared up. The chronological computation of the rapidity with which the level of the soil rises on sites of human habitation in the neolithic age and during later periods is a complex problem which depends on coefficients which are not constant, but variable. I am convinced that in the case of Knossos the quota of 1 metre for every 1000 years, as fixed by Dr. Evans, is too small.

CHAPTER VI

THE COPPER AGE IN CRETE AND PRIMITIVE MINOAN POTTERY

I. THE GREAT "THOLOS" OF HAGHIA TRIADA

AFTER a fire and the desertion of houses through war or plunder, the poor people search so carefully among the ashes and the ruins that scarcely a scrap of metal is left. If this is the case now it would naturally be done with still more care when copper and bronze were precious metals. It is therefore difficult to find objects of copper or bronze in the prehistoric dwellings except in the great palaces where it was not possible to remove all the ruins. The tombs only, when not already spoiled, yield objects of metal.

The years 1904 and 1905 were memorable for the excavations of the Italian Archæological Mission at Haghia Triada,[1] and by the Cretan Government in the cemetery of Kumasa, near Gortyna, when the most ancient tomb now known in Crete came to light. To reach this great *tholos* (Fig. 57) we descend from the hill of Phæstos and, following the river, approach the sea near Haghia Triada. In Fig. 57 we see the circular wall which enclosed the great tomb on the slope of the hill before the *tholos* was entirely cleared. On the ground are the remains of the skeletons. The roof has been destroyed and the material dispersed. The entrance is seen opposite. The destruction of the skeletons, which had been removed and mixed to make room for successive interments,

[1] Halbherr, *Memorie Istituto Lombardo*, xxi. 1905.

FIG. 57.—THE GREAT "THOLOS" OF HAGHIA TRIADA.

prevented us from counting the number of persons buried; but by an approximate calculation we decided that about two hundred bodies had been buried there. About fifty were found in twelve small compartments communicating with each other and with the entrance corridor. It did not appear to be the private tomb of a family, for it is too large; it was more probably the tomb of a tribe in which the bodies had been buried for a century or so. This length of time is deduced from the transformation observed in the type of the weapons and pottery. The vases of perfumes and unguents, the caskets, the cups of marble, granite and alabaster, were more than fifty in number.[1]

2. COPPER DAGGERS

The daggers from the great *tholos* of Haghia Triada are of copper. Figs. 58 and 59 show two of the actual size now in the Prehistoric Museum in Rome. If we deduct the length of the part which would fit into the handle (Fig. 59) there remains a blade only 6 centimetres in length. This small size is characteristic of primitive weapons, and can be explained if we take into account the high value of copper. The triangular shape remaining constant, the daggers of Figs. 61, 62, with their notable differences, show the modifications and attempts at a better method of fixing the blade into the handle. Fig. 61, F, is one of the shortest daggers known. When I speak of the age of copper in Italy we shall see that these small triangular daggers were used also in the terremare. Figs. 61, E, 62, C, show an improvement in the technique. Copper being a metal that bends easily, the blade had been strengthened in the middle by a rib running down the centre. All these weapons are of copper. The dagger, Fig. 63, which comes from a tomb at Palaikastro, contemporary with the great *tholos* of Haghia Triada, is 156 millimetres in length; I have analysed the metal and found it to consist of copper with a thousandth part of zinc and lead (copper, 99·54; zinc, 0·16; lead, 0·13 per cent.). The two knives, Figs.

[1] Halbherr, *Rendiconti Accad. Lincei*, 17 Dicembre, 1905, xiv.

63, 64, are important for the history of arms, because they represent the forms most common in the Mediterranean basin, and these are the most ancient examples of which we know the date sufficiently nearly. Fig. 63 is a knife with four apertures by

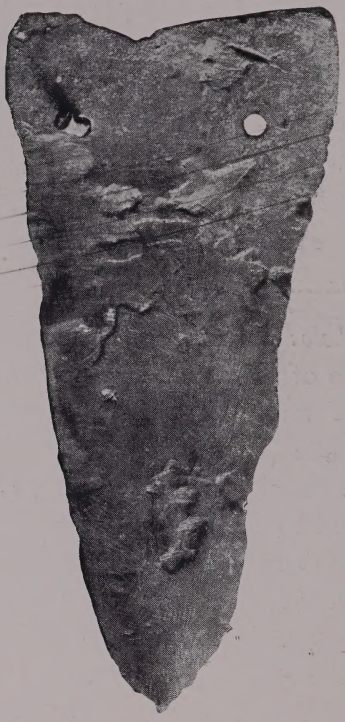


FIG. 58.—COPPER DAGGER FROM THE "THOLOS" OF HAGHIA TRIADA.

FIG. 59.—COPPER DAGGER FROM THE "THOLOS" OF HAGHIA TRIADA.

which to fix on the handle. Fig. 64 is a weapon with both point and edge.[1] Dr. Xanthoudides found at Portì, near Kumasa,

[1] I analysed the two triangular daggers from the *tholos* of Haghia Triada—a very short one which I reproduced in my paper, "R. Accad. delle Scienze di Torino," *Scienze Morali*, vol. v. 1907, Plate I. Fig. 1; the other is Fig. 60, both of copper. From the analysis I know Fig. 60 to be of pure copper. The dagger, Fig. 64, contains copper 98·617, tin 0·158 per cent. This is a negligible quantity of tin, which may be regarded as an impurity of the copper.

Archæologists will join me in gratitude to Dr. Hazzidaki, Ephor of Cretan

three small daggers exactly like those of the great *tholos* of Haghia Triada ; they are 10–11 centimetres in length, triangular, with

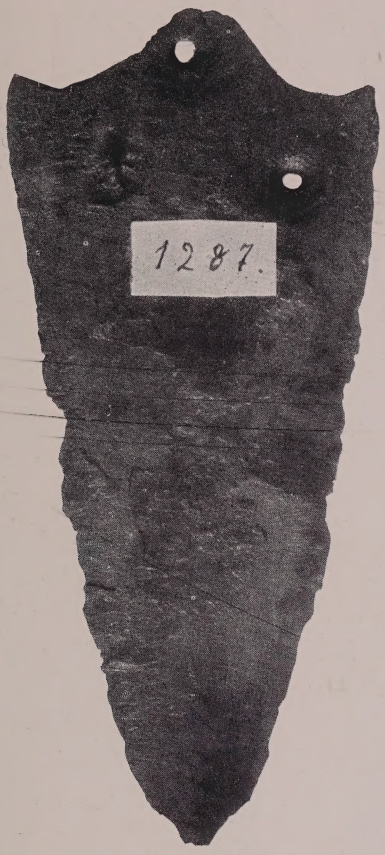


FIG. 60.—COPPER DAGGER BLADE DISCOVERED IN THE "THOLOS" OF HAGHIA TRIADA.

the base slightly concave, 5 centimetres broad, and with only two apertures for rivets to fasten on the handle. Dr. Hazzidaki,

Antiquities, who allowed me to establish the fact that these weapons are of copper—not only giving me four samples of the metal, but permitting me to assure myself by physical examination that the weapons from the great *tholos* of Haghia Triada belong to the copper age. This act of rare scientific high-mindedness in the Ephor of the Museum of Candia enabled me to establish with certainty an important historical fact, which the sight only of the objects would not have allowed me to testify to.

FIGS. 61, 62.—SIX COPPER BLADES FROM THE "THOLOS" OF HAGHIA TRIADA.

Ephor of Antiquities in Crete, kindly allowed me to analyse one of these daggers, and I found that it was of copper. Tin is contained

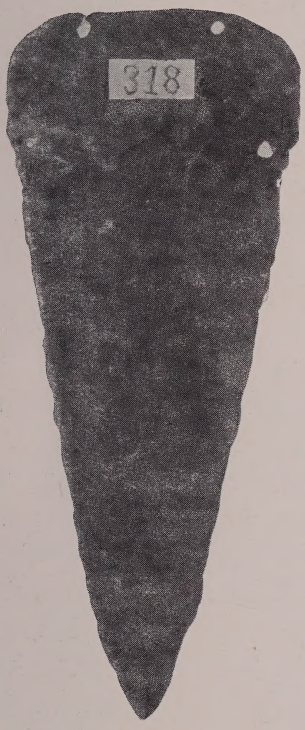


FIG. 63.—COPPER DAGGER FROM PALAIKASTRO.
(1 cm. less than the actual size.)

FIG. 64.—COPPER DAGGER FROM THE GREAT "THOLOS" OF HAGHIA TRIADA.

in so small a quantity (0·197 per cent.) that it does not constitute a true alloy, but may be regarded as an impurity of the copper.[1]

[1] No. 1432 of the catalogue of the Museum of Candia. Copper, 96·500 per cent.; tin, 0·197; lead, 0·170; iron zinc with traces of nickel, 2·400; substances not measured and lost, 0·733.

To complete the picture of these weapons I add Fig. 65, which shows how they were worn. It is a terracotta statuette with a dagger at the belt, and was found at Petsofà di Sitia. Fig. 60 represents a copper blade found in the *tholos* of Haghia Triada, reproduced rather less than the actual size, identical with the dagger of the statuette. Beneath the belt a few folds indicate the loin-cloth,[1] which we see better in another similar figure. The handle of the dagger is flat, it has a boss at the top and widens so as to enclose the short blade. The ears and face of the person are conventionally expressed.

FIG. 65. — MINOAN TERRACOTTA, SHOWING THE FASHION OF WEARING THE DAGGER.

3. EARLY MINOAN POTTERY

In the preceding volume on the excavations in Crete I described the splendid pottery of the most ancient palace of Phæstos, to which was applied the name of Kamares, from the place on Mount Ida where it was first discovered.[2] In its exquisite style of art, in the good taste of its polychrome decoration and its extreme thinness of texture, it represents the best of the productions of industry in that very remote period, and there is nothing in Egypt or elsewhere to be compared with it.

[1] Perizoma.

[2] This pottery was first published by Proressor Mariani, who was exploring in Crete at the time of the first chance discoveries, and later on the great deposits were brought to light in the deep strata of Knossos and Phæstos (*Monum. Antiq.* vi.).

It appeared to me a useful thing to collect all the available information upon the early Minoan pottery,[1] which marks the transition between the neolithic pottery and that in which vermilion and orange shine forth with such effect of beauty upon a black or white ground.[2]

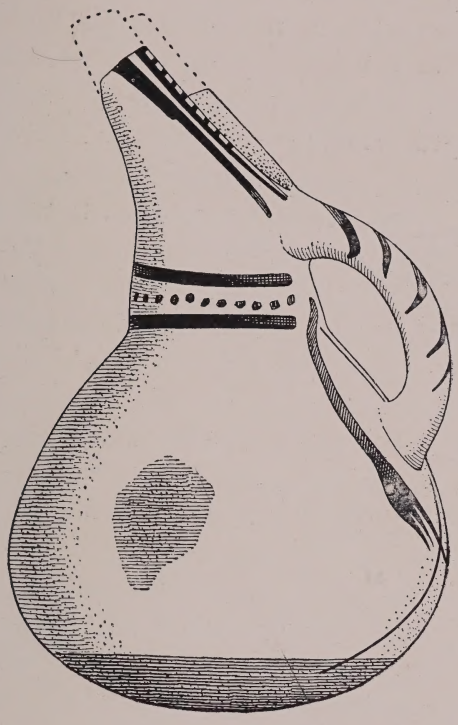


FIG. 66.—JUG DISCOVERED IN THE GREAT "THOLOS" OF HAGHIA TRIADA.

In the great *tholos* of Haghia Triada many vases were found almost intact. The jug of Fig. 66 is of whitish earthenware and

[1] The pottery of the early Minoan period found at Knossos has already been described by Dr. Arthur Evans and Dr. Duncan Mackenzie ("The Pottery of the Minoan Period," *Journal of Hellenic Studies*, vol. xxiii. 1903, p. 164).

[2] We cannot call this ware the pottery of the age of copper, because the pottery of the period before the knowledge of bronze appeared in Italy, on the Continent, and in Egypt with other characters in a less advanced state of evolution; we will call it, according to Dr. Evans's classification, *pottery of the early Minoan period.*

has round the neck two red lines, between these a row of dots. Along the edge of the spout run two other lines, of which the outermost is saw-toothed. Upon the handle and body are some touches of the same colour.

The cup, Fig. 67, presents a more complicated design than the preceding one. This is also of fine whitish earthenware, well baked and decorated with red intertwined lines which imitate basketwork. The two upper lines, parallel to the edge, leave a free space bearing a design of triangles. These details point to a more developed technique than that of the vases which we considered first. The lower part, by the variety and interlacing of the different motives, attests the progress of the art of pottery in this realistic imitation of the osier twigs in a basket. In Italy similar jugs with the same decoration are common in deposits of the neolithic age, and I will not refer to them more particularly.

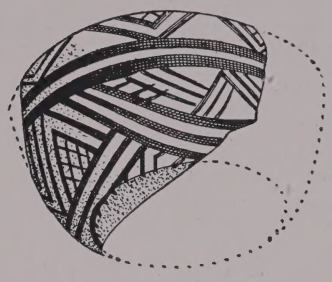


FIG. 67.—BOWL DECORATED WITH RED LINES, DISCOVERED IN THE GREAT "THOLOS" OF HAGHIA TRIADA.

A basin found at Kato Zakro has two small holes at the edge, which possibly served for suspension The outside was decorated with bands of converging lines in red and black. The clay of the vases here described is similar in all; it is a fine whitish clay like that of the Mycenæan vases.

A jug from Knossos, found by Dr. Arthur Evans in the primitive deposit near the room of the pillars, has on the upper part of the jug two lines of colour, chestnut-brown, two others pass round the neck; and on the body of the vase, which is designed with an elegant outline, two lines intertwine and are laterally closed in by two others slightly curved. Within the space, which resembles the wings of a butterfly, there are other interlaced lines.

In a larger jug, with globular body and broad flat base, found at Palaikastro di Sitia, the handle and the upper part of the

spout are wanting. The decoration is of blackish-brown lines ; bands of seven or eight lines each join at a point near the base. Round the neck are four lines, and above and below are dots and strokes of the same colour. Round the upper edge were other lines parallel to the spout.

A small jug, like the preceding one comes from Gournià ; the globular body is nearly covered by red lines which radiate from the handle. In the front the upper line passes down across the body of the vase to the base, the other top line is arranged in the same way, so that two vacant triangular spaces are left—a small one above and a larger below. Four parallel lines edge this space. The greater triangular space is partly filled up by a figure of clove-shaped triangles. The handle is encircled by three red rings, and round the neck are other horizontal red lines.[1]

The upper part of a jug found at Vassiliki, near Gournià ; is decorated with red and brown lines, which form six cones on the body of the vase. The lines cross at an acute angle ; round the neck is the usual decoration of horizontal circles in brown ; half the vase with the handle and spout are missing.

A vase of rather a redder shade ; had two handles on the body and a large round foot forming the base. The neck rises vertically in cylindrical form, as in the common types of the neolithic age. The body is formed of two conic sections placed one upon the other and joined together. The decoration is of pure neolithic design, and consists of triangles with short base and two longer sides, within which is a network of black lines. In the lower segment a fish-bone is drawn round the vase, while the neck is encircled by a horizontal line.

A vase from Sant' Onofrio, Phæstos ; is of yellow earthenware, fine, and well baked. The decoration of red lines is drawn with a sure hand round the neck, on the handle, and on the globular body. In this case also the lines tend to form cones, with the lines crossing at the top and groups of wide and narrow

[1] For these particulars see account by Harriet Boyd, "Gournià," Plate XXV. *University of Pennsylvania, Transactions of the Depart. of Archæology*, col. i. pt. iii. 1905.

lines arranged in bands passing vertically from the neck to the base.[1]

A vase found at San Giovanni di Hierapetra is similar to the last. In this example also the clay is rather redder than usual. The decoration is in neolithic style, and represents a network of interlaced lines forming two triangles, one on each side of the body of the vase. Two handles set horizontally are also decorated. The neck was covered with a deeper red colour, which forms a ring at the top. The foot, partly broken, formed a conical ring with the vertex upward.

4. COLOURED POTTERY

In the earth beneath the second palace I found the piece of a dish reproduced on Fig. 68. It is of yellow clay, fine, well baked and hand-made, 9 millimetres thick, with a narrow border round the edge. Upon the surface a slip of yellow has been applied rather lighter than the colour of the clay of which the dish is made. A great red streak divides the dish into two segments, one of which is covered with a network of red lines, crossing obliquely. Any one who has seen in the Museum of Syracuse or in Rome the Siculan vases described by Orsi will admit that before the earliest Siculan period a similar pottery was made in Greece. The recent excavations made in neolithic soil in Thessaly by Dr. Tsountas brought to light the same characteristic motives of the first Siculan period. At Phæstos, as in Thessaly, the vases are painted both inside and out; the designs in brick-red lines are, in colour, interlacing and variety of width, identical with those of Monte Tabuto (to give an example from a locality well known to students of archæology).

In comparing this pottery with the marvellous designs painted on the vases found in the magazines of the first palace of Phæstos, we are surprised by the simplicity of the geometric

[1] An illustration of this vase, which is in perfect preservation, was published with another by Dr. Mariani (*Monumenti Antichi*, vi. Plate X. Fig. 23 p. 343).

designs which preceded the efflorescence of the brilliantly coloured Kamares ware, with its designs of rosettes and marguerites, with spirals and festoons among leaves and garlands of astonishing beauty.

With this pottery of the copper age we have obtained a knowledge of a part of the domestic surroundings in which the life of the Cretan people passed, before the building of the great

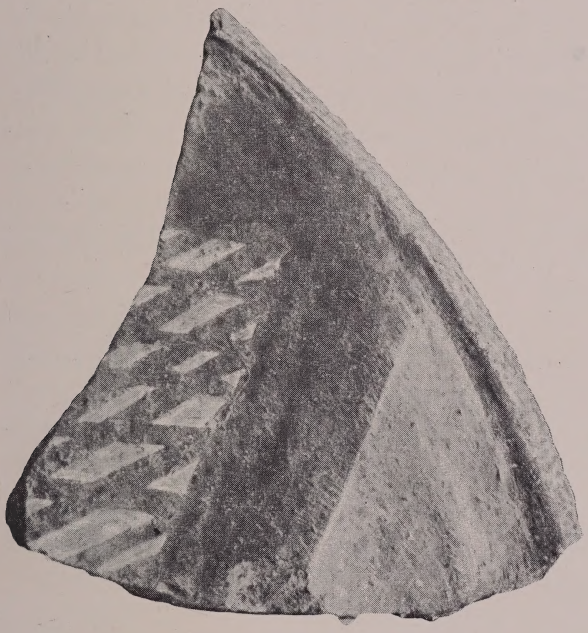


FIG. 68.—EARLY MINOAN PLATE FROM PHÆSTOS, DECORATED WITH RED LINES AND BANDS.

palaces of Phæstos and Knossos. It was the people of the time following the neolithic age who used these vases; but their type, decoration, firing, clay, technique, and the fact that the potter's wheel was still unknown, show them to be of neolithic fabrication like the preceding vases. As to the density of the population in neolithic times we have very little evidence.[1] We cannot, however, admit that the population of Crete in the early Minoan

[1] Beloch, *Biblioteca dell' Economista*, xix. 1908, p. 435.

period was very scanty; possibly in many districts there were more inhabitants than at present. The plain of Messarà, beneath the hill of Phæstos, was very thickly populated in the early Minoan period. Dr. Xanthoudides found there seven villages with the tombs within a radius of three miles round Kumasa, and only a few months ago two other settlements were discovered to the north of Gortyna, by the Cretan Ephors.

In 1894 Dr. Halbherr found a great number of settlements in the provinces to the east and west of the valley of Messarà, and in the same year not a few were discovered by Drs. Mariani and Taramelli, especially in the provinces of Malivisi and Pediada. If the Italian Archæological mission were to make a map of these districts it would be of great use. Homer called Crete the Island of the Hundred Cities, and said that an infinite number of men dwelt there (ἀπειρέσιοι . . .), and recent excavations confirm the statement that Crete was a hive of men.

As in Mediæval Italy and, before that, in Babylonia and Egypt, the density of the population must be considered a very variable figure, depending not only on geographical but still more on economical and political conditions.

CHAPTER VII

THE DIFFUSION OF CULTURE AND THE LAPSE OF TIME STUDIED BY MEANS OF THE POTTERY

I. THE COLOURED NEOLITHIC POTTERY

AMONG all the remains which may help us out of the darkness of the unknown in the study of prehistory the most abundant and best preserved belong to the department of pottery. The neolithic houses were simple huts, which have disappeared with the clothes and the wooden objects forming the furniture of the dwellings. When the stone weapons were worn or broken they were sharpened again and scarcely altered in shape. Only the pottery shows us the life of the people who have vanished, for the kitchen utensils have passed through a continual evolution, and there is great variety in the design of the decorations.

It is by means of the pottery that we know, for instance, that in the Island of Crete the hill of Knossos was first inhabited, and much later that of Phæstos ; for the residuum of the habitation accumulated underfoot and round the huts formed strata of greater or less depth and containing different pottery. The fragments of pottery found at Knossos by Dr. A. Evans and Dr. Mackenzie upon the virgin soil are plain, while in strata of less depth they appear decorated with geometrical designs and incised lines filled with a white substance. The inhabitants arrived later on the hill of Phæstos, when coloured pottery was already in use. Thus by simply examining the sherds thrown away among the rubbish round the huts we can reconstitute

the story of the people who lived for many centuries on the same site, around which mounds of detritus were by degrees accumulated. We have already considered the most ancient Minoan pottery, and will now examine the neolithic coloured ware, which has been till lately the least known, and by means of which we may learn something of the diffusion of Mediterranean civilisation during the last period of the stone age. When I have told of my own discoveries, and the relations between Italy and Crete of the neolithic age to which they testify, I will discuss the diffusion of Minoan and Mycenæan pottery to give an idea of the commercial relations in the later prehistoric period.

When the first examples of coloured pottery came to light at Phæstos within neolithic strata of greater depth than had ever been excavated before in Mediterranean lands, I perceived that a great step had been made towards the solution of the chronology of the neolithic age. But the question was becoming more complicated, for now we must find out where colour was first applied to pottery. All that had up to this point been discovered in the valley of the Nile seemed to be of more recent origin. At the time when I was excavating in Crete Professor Tsountas was carrying on excavations in Thessaly at Dimini and Sesklos, where coloured vases were found in the neolithic soil ; but the neolithic discoveries in Thessaly were of little service in the question of chronology, for the neolithic age lasted in Northern Greece till within a few centuries of the Mycenæan period. In a paper which I presented before the Accademia dei Lincei [1] I examined the information we so far possess upon coloured pottery and its diffusion. I will not enter here into this discussion, as the neolithic period lasted for several thousand years, and in describing the various qualities of the vases found in Europe we must take the difference of age into consideration, remembering always that these vases from Crete are the most ancient vases with coloured decoration at present known in the basin of the Mediterranean.

In Figs. 2 and 3 ("Palaces of Crete") P marks the place where

[1] A. Mosso, "La ceramica neolitica colorata," *Monumenti Antichi*, vol. xix.

I dug a deep pit, shown in Fig. 4. I dug a larger pit at the outside corner of Fig. 2. I reproduce in Fig. 68 a fragment of the pottery of Phæstos, and say at once, in order to fix the attention of the reader, that I discovered similar pottery in the neolithic station of the Pulo near Molfetta, and that by the help of this pottery we may be able to make out the origin of the neolithic pottery discovered by Professor Paolo Orsi in Sicily, though up to the present time nothing is known either as to its origin or its evolution. Having removed the pavement then, we dug a pit 2 metres 10 centimetres in breadth, 4 metres 20 centimetres in length, and 5 metres in depth. At the depth of about 1 metre we found a portion of the neck of a vase 10 millimetres in breadth, with chestnut-brown decoration on a light yellow ground. This vase is also decorated inside with broad lines of red crossing at right angles. The fact that the vases at Phæstos are coloured inside as well as out shows a close connection between these and other vases decorated with the same colours and same designs found in Italy and elsewhere.

A little lower down we discovered the foundation of a hut, but the details of this excavation will be found in Chapter IV., and I will proceed at once to the fragment of coloured pottery found at the fifth and last metre—a piece of a vase of yellowish earthenware, well fired and smooth, with a decoration of red-brown lines meeting at an acute angle. The lines are arranged in two bands, one of five and the other of four lines hastily traced in a pale shade of red. The earthenware is 2 to 3 millimetres thick. A fragment from the body of a vase of the same clay, decorated with red and brown lines interlaced like the reeds of a basket, was found also. Another fragment is of rather greyer earthenware, thin and fine, and is decorated with chestnut-brown lines, interlaced at an oblique angle like the former pieces. Here we find in strata of less uncertain date the same motives of neolithic decoration which I discovered in the stations near Molfetta.

In another pit, B, which I had excavated in the area of the theatre, near the border which crosses the platea to the flight of

steps not far from the corner of the most ancient palace, I again discovered fragments of coloured pottery, mixed with other pieces having no coloured decoration. They are mostly of yellowish earthenware, fine, well baked, and made without the wheel. One fragment found in the third metre below the level of the theatre is a piece of the edge of a cylindrical vase decorated with broad red bands in an oblique direction.

Among the various coloured fragments found at a depth of 5 metres is one of greyish white clay, upon which a uniform yellow slip has been applied. This preliminary process, which is a preparation for the following decoration, marks an important stage in the evolution of pottery. Large brown stripes were next traced upon the vase, but in this case the small size of the fragment prevents us from seeing the direction of these lines upon the surface of the vase.

Another is of fine yellow earth with brown lines in reticulate bands. This pottery has a great resemblance to the coloured neolithic pottery found in other countries of the Mediterranean, notably in Greece and Italy. I was somewhat puzzled by seeing coloured pottery at a depth of 5 metres below the pavement of the most ancient palace of Phæstos, when Dr. Evans and Dr. Mackenzie had no record of discovering any pottery with coloured decoration in their excavations in the same neolithic soil at Knossos.

It has been seen that a considerable part of the upper strata of the hill of Knossos was removed when the foundations of the primitive palace were laid. The construction with rough walls, which forms the transition from the simple hut to the monumental structure of the palaces, is absent both at Knossos and Phæstos, and this period of transition must have been of considerable duration.

I requested Dr. Hazzidaki to make a careful examination of the stores of material from Knossos, and he writes, November 3, 1909, that he has discovered amongst the neolithic material which came to light 1 metre below the most ancient palace, a fragment, probably of a goblet, of red and lustrous, well-polished,

hand-made pottery, with three bands of cream colour upon the red ground of the vase. Another piece from the same depth is of the same red colour and is decorated with an orange-red band. There are two more coloured fragments, but it is uncertain if they are really neolithic or have fallen from the upper strata.

This is the present state of our knowledge on the subject, which is still at an elementary stage, while we await the publication of Dr. Evans's complete book on the palace of Knossos—the eagerly expected crown of his immortal work.

2. PREHISTORIC RELATIONS OF EGYPT WITH THE AEGEAN

However far the researches of archæologists may reach, no period has been found in which Egyptian civilisation is isolated and unconnected with the Aegean. And, as I shall again show in this volume, the most competent archæologists are of opinion that the first inhabitants of Egypt came from Libya in the neolithic age. The recent discoveries in the Semitic East, grand though they may be, like that of the code of Hammurabi, have been of small use towards our study in chronology. Bronze only appears in the Ist Dynasty of Babel about 2250 B.C., while according to my analyses in Egypt laminated bronze is found there in 4000 B.C.

Egyptologists are unfortunately not agreed as to the date of Menes and the beginning of the Ist Dynasty. Dr. Flinders Petrie and Dr. Ed. Meyer, two of the chief authorities on Egyptian chronology, differ from each other by 1460 years in fixing this date. Dr. Evans accepts the chronology of Dr. Petrie, who gives the earliest date, and, as I shall show later on, has arrived at conclusions that I cannot accept because they attribute to the neolithic age at Knossos a duration of seven thousand years, which duration appears to me to be as long again as the time to be accounted for. Dr. Petrie and Dr. Evans fix their date too far back, and Dr. Meyer perhaps brings it too far forward. As I am not competent to decide the question I referred to Professor Schiaparelli, Director of the Egyptian

Museum of Turin, who advised me to follow the chronology of Lepsius, which was adopted by Dr. Brugsch and Professor Maspero, and fixes the Ist Dynasty of Menes at about 4000 B.C., while Dr. Ed. Meyer puts it at 3315 B.C. While waiting for fresh evidence to clear up the chronology of the Ist Dynasty we may accept for the present the date of 4000 B.C. as that corresponding to the beginning of the Ist Dynasty.

I will limit myself just now to the consideration of the Egyptian vases resembling the neolithic pottery of Phæstos described in the preceding paragraph.

Dr. Flinders Petrie discovered at Abydos several vases which had probably been brought from the Aegean to the tomb of a Pharaoh.[1] He considers that this pottery, which is distinctly non-Egyptian in shape and manufacture, and is European in character, belongs certainly to the second king of the Ist Dynasty, about 4700 B.C. The vases described by Dr. Petrie as Aegean pottery are decorated with red and brown lines in a design of triangles, with dotted or zigzag patterns arranged in horizontal bands, and have a strong resemblance to the neolithic vases of Phæstos, both in the *café au lait* colour of the clay and the decoration of brown or red. In the shape of the handles and in the general outline these vases resemble the primitive pottery of Crete.

The earliest neolithic coloured pottery discovered up to the present time belongs to Crete, for in Egypt there are no deposits of the depth of 6 or 7 metres such as those of Phæstos and Knossos, and all the known pottery from Egypt is of less antiquity. The fine black pottery, the so-called bucchero, which is so abundantly found in the neolithic strata of Crete, was probably imported from the Aegean into the valley of the Nile. On this point archæologists are not agreed,[2] but Dr. Fimmen[3] is probably right when he says that this fine black pottery,

[1] Flinders Petrie, *The Royal Tombs of the Earliest Dynasties*, 1901, pt. ii. 9, 46, Plate LIV.

[2] Ed. Meyer, *Geschichte der Altertum*, i. § 172.

[3] D. Fimmen, *Zeit und Dauer der Kretisch-Mykenischen Kultur*, p. 42.

of good quality, well fired, and with polished surface, comes from Crete. The designs and incrustations of the decoration, of which the development can be studied in the produce of the neolithic deposits of Phæstos and Knossos, are non-Egyptian in character.

3. KAMARES VASES IN EGYPT

Since Dr. Evans chose the name of the Dynasty of Minos to designate the prehistoric period of Cretan civilisation, he has maintained a neutral position between those who identify the primitive population of Crete with the Pelasgians or Carians, with the Achæans or Libyans, and concentrated the attention of students upon the chronology of the great palaces of Knossos and Phæstos which were the royal residences of a powerful dynasty. According to the Iliad[1] Minos must have lived three generations before the Trojan war, and Herodotus[2] confirms this; but as we do not know whether this war really ever was fought, and still less at what date it occurred, we have no starting-point for our chronology, and Minos remains a figure of mythology. We read in Thucydides[3] that when Minos had a strong navy navigation became more free; he removed the ill-doers who occupied the islands and sent colonies of his own to the greater part of them. It seems strange that so powerful a government should be broken up by an expedition against Sicily.[4]

There are now two divergences of opinion among writers on Cretan prehistory, the one tending to fix the time in which Minos lived at an earlier date, while the other would fix it at a more recent period. The Kamares pottery discovered in Egypt serves to establish the date at which the palaces of Knossos and Phæstos were founded. On this point also we are indebted to Dr. Flinders Petrie for important discoveries. He made excavations at Kahun,[5] a town of the XIIth Dynasty. This was originally a village built by Sesostris II. for the work-

[1] Iliad, xiii. 450 *et seq.* [2] Herodotus, vii. 171.
[3] Thucydides, i. vii. [4] P. 360. [5] Fimmen, *op. cit.*, p. 47.

men who were constructing a pyramid, and had been abandoned after the death of Sesostris.[1] Among the rubbish thrown outside the walls Dr. Petrie discovered fragments of Kamares pottery.

This polychrome ware attained its richest development in the second period of the Middle Minoan age (M.M. II., according to Dr. Evans), which corresponds to the XIIth Dynasty. The relation of the Kamares vases to the XIIth Dynasty was confirmed by the excavations of Dr. Garstang[2] at Abydos, in which, besides seals of Sesostris II. and Amenemhet III., five fragments of Kamares pottery were found.

To explain the discovery of this ware in Egypt we must remember that the excavations at Knossos showed that oil was one of the common products of Crete ; the press for the olives had been found as well as seals bearing an olive branch with the fruit, and galopetre with engraving of vases containing branches of olive with fruit, also vessels containing olives preserved in them for eating. The purple from the murex, of which heaps of shells are found in Crete, was exported by the Minoans to the valley of the Nile, with wool, copper, and pottery.

I have already illustrated several of the Kamares vases to give an idea of their decoration, which surpasses in finish and elegance of design all other pottery of antiquity.[3]

Between the neolithic age and the period in which the Kamares type of vase appeared there was a long interval, during which earthenware vessels began to be made with decoration of various design. Copper was the only metal in use at this time.

The chief improvement in the making of pottery during this period was the invention of the potter's wheel for working clay, so as to render the substance of the vases thinner and more

[1] Petrie, *Kahun, Gurob, and Hawara*, 1890, 21 ; Illahun, *Kahun and Gurob*, 1891.

[2] *Archæological Report*, 1906, p. 79 ; Burrows, *The Discoveries in Crete*, 1907, p. 247.—A. Evans (*Ashmolean Museum*, 1907) records that some of these vases are now at Oxford.

[3] *Monumenti Antichi*, vol. xiv. 1905.

uniform. The large vases of the Middle Minoan period, illustrated at the beginning of the "Palaces of Crete," were still made entirely by hand, while the small vases of the same period are made with the wheel.

The first palaces of Knossos and Phæstos in which the beautiful Kamares vases were discovered, are said to have been built 2000 or 2200 years before the Christian Era.

I was present with Dr. Pernier at a memorable scene when there came to light upon the pavement above the neolithic soil at Phæstos a number of beautiful Kamares vases, of which I reproduced the photograph in "The Palaces of Crete" (Fig. 11).

According to the recent discoveries of Dr. Seager [1] in his excavations at Mochlos and Psira, the invention of the potter's wheel must have been earlier, *i.e.*, in the primitive Minoan age (E.M. II., according to Dr. Evans's classification), but the matter is doubtful, as other competent observers saw no trace of the wheel. The vases described on pages 112–13 are all hand-made, though they belong to a period of less antiquity. If the pottery of Vasiliki was indeed made with the wheel in the second period of the early Minoan age it is a point of the greatest importance. Up to the present it had been believed that the potter's wheel appeared at the same time as bronze; but according to Dr. Seager it must have come into use nearly at the end of the stone age, or at the beginning of the age of copper. The Minoan potters had two methods of decorating pottery of well-fired yellowish clay; they either covered the surface with a black slip and drew designs on it in white, orange, and red, or they applied the pigment upon the natural yellowish surface, which was of the colour of chamois leather.

These two styles were developed at the same time, but the Minoan potters preferred the light polychrome decoration upon a black ground, and were able to reproduce metallic reflections upon the polished black surface. At the close of the second period of the Middle Minoan age the pottery reached the culminating point of naturalistic expression in decoration, and

[1] *American Journal of Archæology*, 1909, p. 289.

by the third period of the Middle Minoan the pottery was already in decadence, so short was the duration of this style in the ceramic art.

4. MYCENÆAN VASES DISCOVERED IN EGYPT

While exploring the rubbish heap of the little Theban town and necropolis in the valley of Deir-el-Medinet, Professor Ernesto Schiaparelli [1] discoverd about fifty examples of Mycenæan pottery.

In the latest Minoan period the vases of Crete are identical with those discovered in the excavations of Mycenæ, and I

FIGS. 69, 70.—MYCENÆAN VASES FOUND AT ERGANOS, CRETE.

reproduce some examples with various types of decoration. The Germans call these vases Bugelkanne, because the handles are made in the shape of a stirrup. The aperture by which the liquid is poured out is at the side ; the sham neck in the centre serves to support the two portions of the handle. The vases, Figs. 69, 70, were discovered at Erganos in Crete by Professor Halbherr.[2] The two vases, Figs. 71, 72, are in the Torcello Museum, Venice. We know not how they got there, but they are probably a relic of some Venetian family who had brought them from Crete at the time when the island was governed by the Venetians.

[1] I have to thank Professor E. Schiaparelli for permission to publish two examples from the Egyptian Museum of Turin.

[2] *American Journal of Archæology*, vol. v. 1901.

Of two examples of the Mycenæan vases found by Professor Schiaparelli in Egypt, one is the so-called stirrup handle of a coloured vase decorated with red-brown lines. The second is a vase with spout for pouring out; the stirrup handle is wanting. The fine yellowish earthenware is decorated with lines of the same red-brown colour. If we placed one piece upon the other we should have a complete vase, though the two parts do not belong to the same vase. From the material discovered with these

FIG. 71.—MYCENÆAN VASE, TORCELLO MUSEUM, VENICE.

examples of pottery, Professor Schiaparelli formed the opinion that the heap of refuse near the Theban necropolis is not later than the XXth Dynasty, which corresponds nearly to the year 1150 B.C. We may therefore conclude that the said pottery was imported into Egypt in the twelfth century B.C.

This would be a fresh argument in favour of the opinion that the pottery of the latest Mycenæan period is not later than the twelfth or eleventh century B.C., though it may possibly have lasted till a later date in other parts of the Mediterranean. But the power of the Cretans as rulers of the sea had already set, for,

as Dr. Evans [1] observes, from the time of the XVIIIth Dynasty the name of the Kephts, or Kephtiu, representing the Minoan navy, disappears from the Egyptian monuments, and the dominion of the Philistine confederation arises, soon to be so troublesome at the delta of the Nile.

Vases with stirrup-shaped handles similar to these, but rather taller, have been recently discovered at Orchomenos by Dr. Bulle.[2] They bear an inscription in Minoan linear characters, Class B. This discovery shows that the Minoan influence extended much farther northward in Greece than has been

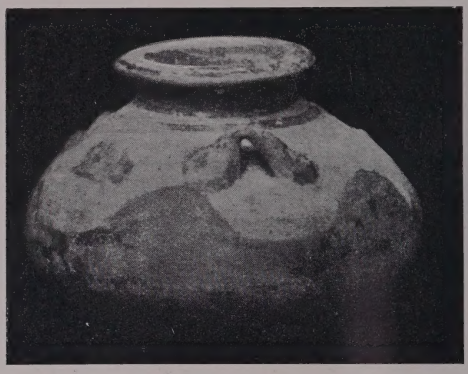


FIG. 72.—MYCENÆAN VASE, TORCELLO MUSEUM, VENICE.

supposed. Palaces similar to the Minoan palaces have been found in Beotia, and the legend attributing to Cadmus the invention of letters takes a new significance, for Cadmus was of Beotia.

5. POTTERY OF THE "PALACE STYLE"

The decoration of the pottery which came into vogue in the last period of the palace of Knossos is termed by Dr. Evans "Palace style." The catastrophe which brought about the

[1] A. Evans, *Scripta Minoa*, p. 59.

[2] H. Bulle, *Die Woche*, 1904, p. 216; *Abhandl. d. K. Akademie d. Wis. München*, xxiv. 1909.

destruction and temporary desertion of the palace of Knossos happened about 1400 B.C. The tasteful decoration of the pottery is in complete harmony with the architecture and the decoration of the rooms of the royal residence of Knossos. Vases of the palace style have been found far from the confines of Crete, in the tombs of Mycenæ and near Sparta, and even on the coast of Canaan.[1]

Here, too, we must refer to Egypt to establish the date of the great catastrophe which destroyed the palace of Knossos. At Tel-el-Amarna hundreds of fragments of Aegean pottery of the palace style with decoration of a decadent type were found, and other vases of the latest Minoan age were discovered in contemporary Egyptian tombs. The catastrophe of the palace of Knossos must therefore correspond to 1380 B.C.

Some parts of the palace were again occupied after the destruction, and this also is proved by the pottery ; the plebeians who seem to have come into power substituted simple clay vases for those of metal.

With the reoccupation of the palace and successive incursions there appears upon the scene a people possessing the same culture as the Greeks of the mainland (Dr. Evans allows that this is possible) ; but the pottery made to imitate the forms of the metal vases shows that the tradition was not interrupted for very long. The great prehistoric civilisation of Crete was nearing its end. The classic culture of Greece was coming into bloom after long lying dormant, and its efflorescence was brief. Dr. Schliemann's excavations at Mycenæ gave us no written documents, and Crete in her decline became the mother of Mycenæan civilisation, and shines with a melancholy light, gradually dying down to a last spark. Civilisation is still Minoan, but the Cretan people have become poor.

The great cemetery of Zapher Papoura near Knossos, which was explored by Dr. Evans in 1904, shows us the state of Minoan civilisation at the end of the palace period (*i.e.*, late Minoan III.). The models from which vases were painted in

[1] A. Evans, *Prehistoric Tombs of Knossos*, p. 107.

the grand style of the palace, the frescoes, the engraved stones, the metal-work, all were still imitated. After a period of immobility in art there ensued a gradual decadence, but the course of Minoan civilisation does not seem to have been

FIG. 73.—MINOAN VASE, PALACE STYLE.

interrupted, it only sinks down like a setting sun. I here show a vase in the palace style, but decadent, as an example of the last stirrings of the great Cretan art of pottery (Fig. 73).

It is a great amphora, ½ metre in height. Below the neck is a design of leaves, which passes down by the handles, dividing

the vase into three compartments. Upon the body of the vase are architectural motives, separated by bands of black and white, chess-board pattern. Dr. Evans does not derive these designs from the rosettes characteristic of Mycenæ, but considers them on the other hand as a degeneration, and that they represent the curved extremity of the sacred axe.

Nothing is more instructive in the history of art than this decadence, which corresponds to the Mycenæan period of the Continent.[1]

Ornament degenerates and the happy imitation of Nature vanishes, the faithful study of animals, the fauna and the maritime flora, which were the speciality of the Minoan artists, deviate more and more from the truth and conventionalism triumphs. The Minoan people, poorer and more numerous, their ancient prestige lost, urged perhaps by poverty, are incited to emigrate to all parts of the Mediterranean basin. Even in Sicily we find these amphoræ in the palace style.

These were the last flickers of Minoan civilisation, and after so many thousand years of maritime power and artistic glory the Island of Crete fell by degrees back into barbarism.[2]

[1] According to Dr. Evans the tomb of Isopata, where these vases were, is anterior to the tombs of Mycenæ.

[2] Charles and Harriet Hawes have recently published a valuable book for the general study of Minoan art and history : *Crete, the Forerunner of Greece*, London, 1909.

CHAPTER VIII

THE SACRED AXE

I. VOTIVE AXES OF STONE

THE history and philosophy of religion are neglected in the teaching of the Universities. The students of these subjects are few, and there is no impulse from the higher powers tending to the reform of the curriculum. The apathy of the Universities is all the stranger that the public is now more than ever interested in the question of religion. After having passed the greater part of my life in experimental research I have now to consider Mediterranean religion. The novelty of the subject had so great a fascination for me that the whole book reflects the deep emotion which these researches produce in me. I am only sorry to be so inferior to the loftiness of the subject, to the poetry and the value of recent discovery to the history of human thought.

The first offerings made to the mysterious power which rules the world were weapons. Votive axes were in use from the neolithic age, for some were discovered in the tombs made of such friable sandstone that they could serve no practical purpose and must certainly have been sacred images or objects for funeral use.[1] This axe, Fig. 74, was found by me in the excavations of

[1] Pigorini, "Del culto delle armi di pietra nell' età neolitica," *Bullet. paletn. ital.*, xi. 1885, p. 33. *See* Colini, *Bullet. paletn. ital.*, xxviii. p. 176, Plate XIV. Fig. 6. Colini has here collected the bibliography of the stone axes found outside Italy.

Cannatello, near Girgenti; the handle is of siliceous calcareous stone, pink in colour, in which is enclosed a lump of drab sandstone. The work is well done, for the stone is very hard, and the spikes for the handle were exactly cut.[1] Handles for similar axes are found in the terremare and in the palafitte. These images are made of stag's horn. I have already published one in my "Excavations of Cannatello,"[2] and here I reproduce another, which comes from the Lake of Neuchâtel (Fig. 75).

Among the votive weapons which were in use in the stone age I present one which was given to me by Professor G. Bellucci, of the University of Perugia, that I might publish it with two

FIG. 74.—VOTIVE AXE OF STONE, DISCOVERED AT CANNATELLO, NEAR GIRGENTI.

others also found in Apulia (Fig. 76). The axe A, Fig. 76, is identical with that from Phæstos (Fig. 54), and is a simple flint which had a cutting edge given to it at one end by grinding it with sand or by sharpening it on some kind of millstone. The other end has been left oval and sharpened so as to fit into the handle. These flints made into axes, being the tool and weapon

[1] The oval part of the axe is 27 millimetres in breadth at the insertion of the handle, 25 millimetres, and 15 millimetres in thickness at the base. The handle is broken at the distance of 35 millimetres. The axe is attached to the handle in the same direction as a hatchet—that is, with the blade parallel to the handle.

[2] *Monumenti Antichi*, vol. xviii. p. 667.

most easy to make, continued in use even when the flint-knapping industry had so far progressed that the hardest stones could be well polished and cut into a parallelopiped with parallel facets, or a triangular prism. The axes B, C, Fig. 76, represent the first type of the most ancient copper axes, which resemble the flints which are only worked at one end ; the surface is generally rough and uneven with small lumps caused by imperfect fusion in moulds with unpolished sides.[1] These two copper axes show an elliptical section, except at the cutting part, where the thinned

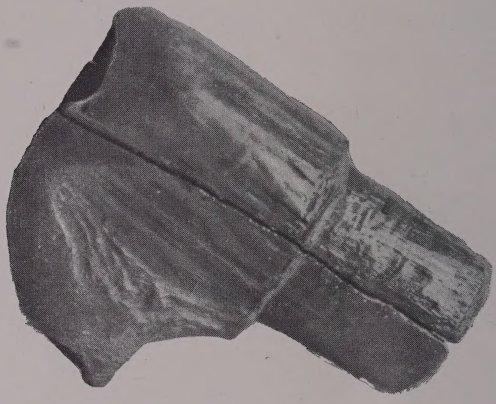


FIG. 75.—VOTIVE AXE, MADE OF STAG'S HORN, FROM THE PALAFITTE OF NEUCHÂTEL.

part of the blade has a quadrangular section ; at the other end they are conical in shape.[2]

The stone axe A is the same length as the axe B ; it is green in colour and appears to be of serpentine. All these three axes are coloured red by means of ferrous ochre, which adheres tenaciously to the surface ; for this reason we must regard them as votive axes. In the tomb of Sgurgola[3] were two arrows

[1] Professor Colini has made a study of these copper axes. I refer to his article for the bibliography and the illustration published by him (*Bull. di paletn. ital.*, xxvi. 1900, p. 232).

[2] The larger is 107 millimetres long, and the blade 36 millimetres. The other is 86 millimetres in length, 29 millimetres in breadth.

[3] Colini, *Bull. di paletn. ital.*, xxiv. p. 209.

coloured red with cinnabar. The grave consisted of a niche at the bottom of a pit cut out in the travertine; in it was found a skull, also coloured red at the back. The furniture of the tomb was a clay vase, a pierced hammer with head and blade, and a copper dagger of the Minoan type, made with a tongue like that from Haghia Triada (Fig. 64). This coloration of the skeletons

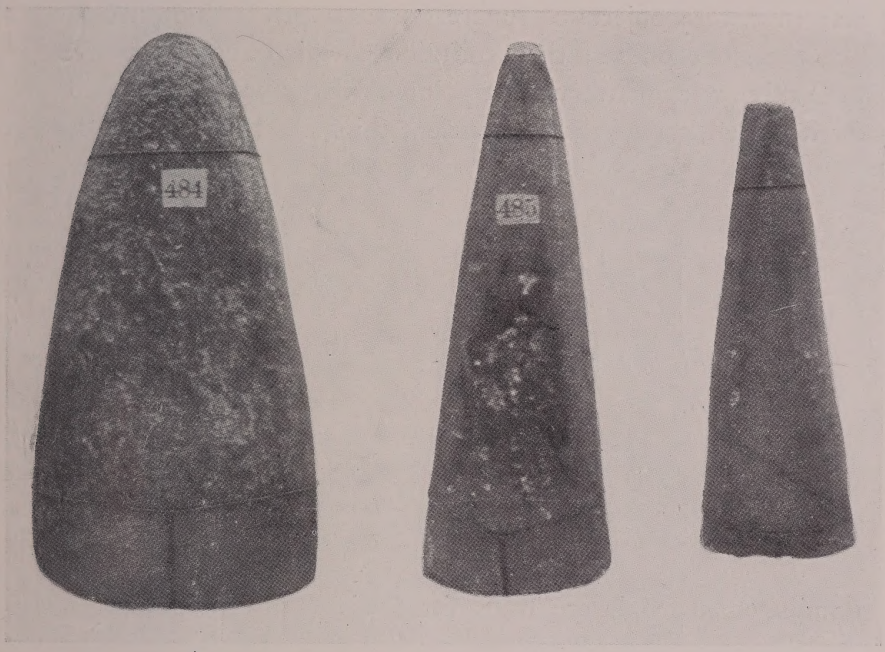


FIG. 76.—A, VOTIVE AXE OF STONE COLOURED RED. B, C, COPPER AXES COLOURED RED.

with ferrous ochre is a subject to which I shall return in Chapter XVI.

At Kumasa, in a *tholos* belonging to the third period of the Early Minoan age, Dr. Xanthoudides found two small axes, of which I give an illustration of the actual size (Fig. 77); they are made of a thin plate of copper and have each two small holes at the back, and resemble in shape the flat axes of the Continent —*i.e.*, they are narrow at the handle end and have the blade

widening in bell shape, with the cutting edge rounded. Six other similar axes come from a *tholos* of the same period. It is difficult to fix an exact date, but we may suppose that they date back to 3000 B.C. The fact that these flat axes are the first to appear in the *tholoi*, and that the double-headed axes are not found with them, suffices to establish their precedence in chronological order; the fact that they are found in the tombs suggests that they were objects of funereal use or pendants of necklaces like the stone ones of the neolithic era which abound in Crete.

Votive weapons serve as a point of departure in chronology, for it is well known that the ancient things and ideas which have

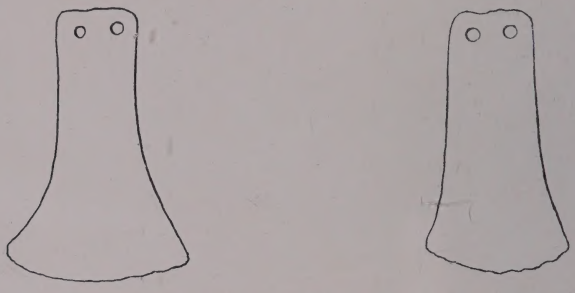


FIG. 77.—VOTIVE AXES OF COPPER FOUND AT KUMASA. ACTUAL SIZE.

dominated a people are transmitted with the symbols and rites of religion. The presence of small axes of this form in Crete proves that a larger axe of identical shape with a widened and curved blade was already in use in very remote times. We may therefore predict almost with certainty that in Crete also will be found flat axes such as have already come to light in the Cyclades; indeed, Professor Tsountas[1] discovered on the Acropolis of Sesklos two flat copper axes of identical form with those which have come to light on the hut foundations of Italy.

The finding of the same little axes in Sicily attests the primitive connection between the two countries. Professor P. Orsi

[1] Tsountas, *Dimini e Sesklos*, 1908. Copper, 99 per cent.; tin, 0·17 per cent.

found in the Siculan necropolis of Cava Signora di Castelluccio a tiny reproduction of the flat axe, of which I show a figure of the actual size (Fig. 78). It is of copper, 33 millimetres in length. Having no hole for suspension, we must suppose that it had a handle like the large axes, and was kept as a cultus object or deposited in a tomb. Two other examples of similar

FIG. 78.—SMALL VOTIVE AXE, DISCOVERED IN SICILY.

FIG. 79.—VOTIVE AXE OF COPPER, DISCOVERED IN SICILY. ACTUAL SIZE.

little axes exist in Sicily and have been recorded by Professor Orsi in the work already quoted.[1]

A small copper hatchet, found at Palaikastro, is 68 millimetres in length (Fig. 80, A, 316). An identical hatchet was found by Professor Orsi at Cassibile; it is shown of natural size on Fig. 79. There are about twenty similar axes in the Museum at Syracuse, which have probably served as *ex votos*. The axe of Fig. 79 does not belong to the copper age, for it was found suspended to the pin or tongue of a bronze fibula decorated with broken lines,

[1] Orsi, *Monumenti Antichi*, ix. Plate XIII.

which cover the bow; some axes were recently found in Thessaly, which proved on analysis to be of almost pure copper.[1]

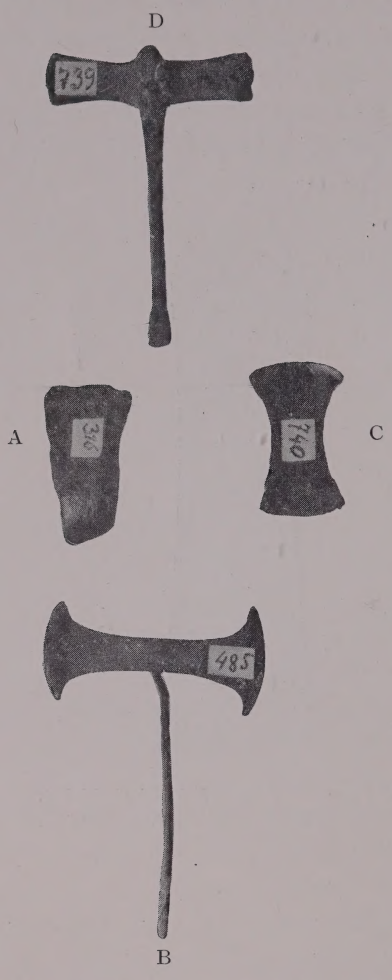


FIG. 80.—MINOAN VOTIVE AXES OF COPPER. RATHER LESS THAN THE ACTUAL SIZE.

2. VOTIVE DOUBLE-HEADED AXES

Small votive double-headed axes and hatchets are common in Crete, and I show three—B, C, D—one with no handle and two with handles. Fig. 80, C, cut from a thin sheet of copper, is identical with two little double axes made of gold leaf found by Dr. Schliemann in the fourth tomb at Mycenæ.[2] This was found at Haghia Triada; the other two, B and D, have handles, and from them we may judge of the proportionate length of the handles of the double axes. At Knossos Dr. Evans discovered a small votive double axe of gilt bronze of the same form and shape as that of Fig. 80, C.[3]

Small double axes made of steatite are fairly common in Crete, but I do not propose to describe all the valuable material referring to my subject contained by the Museum of Candia. I will notice here the difference between the form of the double axe (Fig. 80, D) from Haghia

[1] Tsountas, Ἐφημ. ἀρχ., 1898, Plate XII. Fig. 7.
[2] Schliemann, *Mycenæ*, p. 291, Fig. 368.
[3] Evans, *Knossos Excavations*, 1902, p. 101.

Triada and another (B) from Psychro. In the latter the blade widens and seems to be of a type different from the other double axes which were used as implements of a craft. The larger sacred bipennæ have as a characteristic a large bowed blade, often thrice the width of the central part.

The most ancient bipennæ consist of two square axes, which form a parallelogram ; later the blade is widened and the cutting edge rounded, the heel is narrowed and the outline takes the form of a bell. The same thing happened with the flat axe.

Fig. 81 was discovered at Haghia Triada ; it is 158 millimetres in length. Dr. Halbherr, in describing it, says : " This has along the longitudinal margins a furrow with a projecting fillet, which gives the impression of having been filled with enamel or a facing of nobler metal. It may have been a votive object or cult symbol belonging to one of the shrines." [1]

FIG. 81.—DOUBLE AXE, WITH DECORATION, FROM HAGHIA TRIADA.

We must distinguish between the great bipennæ which were true cultus images and the votive bipennæ. This distinction, as Halbherr was the first to note,[2] depends on their different size. Those which were fixed on long staves and raised above pyramidal bases in sacred places will be shown in Chapter XII., where they appear in a painting on a sarcophagus as objects of worship. Upon a square marble base consisting of two parallelopipeds, of which the smaller rests upon the larger, stands a conical staff rather above the height of a man. The lower end of the staff passes through the opening in the stone base, and the upper part gradually diminishes in size in cone fashion to the top, which

[1] *Monumenti Antichi*, xiii. p. 68.

[2] Halbherr, *Memorie Istituto Lombardo*, xxi. 1905.

supports the double axe. There were several of these stone bases, but till the discovery of the sarcophagus at Haghia Triada no one knew what they were for. Dr. Halbherr has described this sarcophagus with its decoration of bands of zigzag lines.[1] Upon

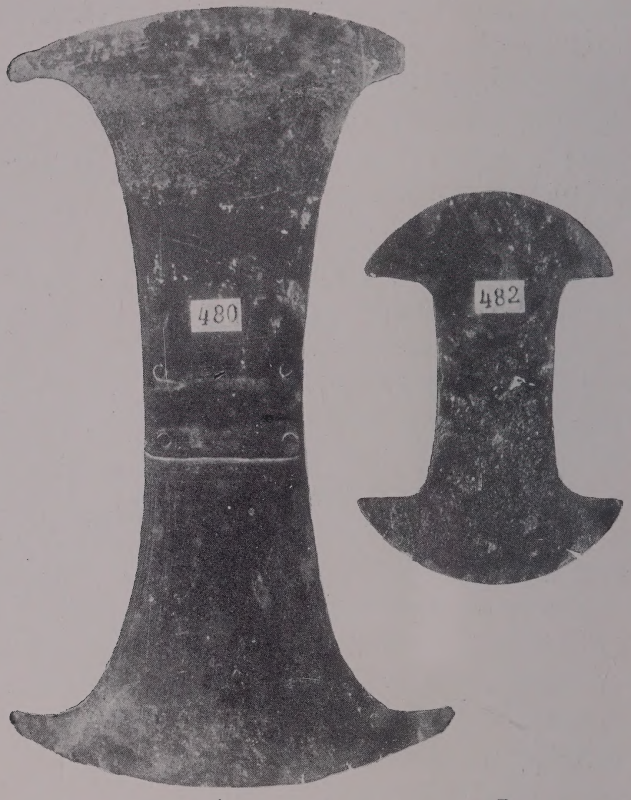


FIG. 82.—VOTIVE DOUBLE AXES MADE FROM A THIN PLATE OF COPPER, DISCOVERED IN CRETE.

the sarcophagus is painted the image of the defunct, who appears beneath the sacred fig-tree before the temple. Upon each of the bipennæ rests a dove. The staff is covered with green leaves on one side; the other is tinted pink.

[1] Halbherr, *op. cit.*, Plate II. Fig. 5.

The form of the votive bipennæ is not always the same, as may be seen in Fig. 82, A, B, which are made from a thin sheet of metal, probably copper. The votive bipenna A was found at Psychro by Dr. Hogarth. We shall see that it is made of two pieces of metallic leaf fastened together by two bent nails. The double axe B is also made of simple copper leaf like the little axe Fig. 80, C. Others were cast in copper or bronze and had the opening for the handle, but were so thin that they could not have borne a strong blow. A characteristic of votive weapons is that they are useless for practical purposes, because they were made either very small or very large. The same shape is found in stone and in bronze in various parts of the Continent, and Dr. Montelius illustrates several of them in his work on the most ancient bronzes.

3. THE DOUBLE AXE AS A VOTIVE IMAGE AND AS A CULTUS SYMBOL

In a chapter on the "Myths and Religions of Crete," [1] and in another on "Woman in Religion," I pointed out that in the beginning Minoan religion had neither idols nor human images for cultus purposes, but that the mystery of reproductive nature and of the great mother of life only was worshipped. When the Cretans felt the need of a symbol of divinity and an object to represent her, they chose the religious simulacrum of the double axe, as the instrument best adapted to express the force which transforms material and, by means of labour, supplies all that is best and most useful to man. The double axe, which had served the people of Minos as a weapon in many a struggle till they gained the empire over the great part of the Mediterranean, this double axe which was the most necessary implement for building the ships which dominated the Aegean, became the symbol of Cretan power, and it was imagined that the divine spirit was immanent in the double axe. At Gournià,[2] as at Knossos,[3]

[1] A. Mosso, *Palaces of Crete*.

[2] *Annual Report Smithsonian Institute*, 1904, Plate II. Fig. 1.

[3] *Annual of the British School at Athens*, viii. p. 97, Fig. 55.

everywhere where cultus objects are found, the double axe came to light. Upon a painted chest at Palaikastro de Sitia are figured at one side the sacral horns, and at the other the double axe in its ritual form—narrow at the handle part and wide, almost semi-circular, at the cutting part of the blade.[1]

In the fourth tomb at Mycenæ, Dr. Schliemann found two bulls' heads, bearing between their horns a double axe of the shape B, D of Fig. 80, the handle resting upon the bull's forehead.

Quadruple axes, as seen on the gold ring from Mycenæ,[2] are often found in Crete, and we shall see them painted on the sarcophagus of Haghia Triada ; other variants will be found in my book on Crete[3] showing the moulds for casting them. They had short handles, as shown in the figure of a woman holding one in her hand, in the act of adoration.[4] In Crete the double axe appears from the most remote times, and we see it painted on the primitive vases of the Kamares type ; later it is found in Greece in the Mycenæan age, which proves that this cult was imported from the island on to the Continent. The relation of Mycenæan with Hellenic civilisation seems to be proved by the fact that the Minoan double axe passed as a sacred symbol into the Greek religion.[5]

[1] The modification undergone by Cretan religion is shown by the fact that the votive double axe rarely appears painted on the vases of the third period of the Middle Minoan epoch. It is, however, frequent on the vases of the first and second periods of the same epoch, and disappears in the last period of the last Minoan epoch.

[2] Schliemann, *Mycenæ*, p. 42.

[3] A. Mosso, *Palaces of Crete*, p. 198.

[4] *Op. cit.*, p. 199.

[5] The axe appears first in the hands of a female divinity, because she is more ancient than Zeus. Later on it is held by Apollo and Zeus in the Hellenic mythology. Many double axes were found by Dr. Hogarth among other votive offerings upon Mount Dicte, where Zeus was said to have been born (*Annual of the British School at Athens*, vi. p. 9). The double axe was painted on Greek vases in Sicily in classical times, and we see it everywhere as a sacred image. In Italy, Professor Orsi has recently published another very fine illustration of a double axe from Gela (*Monum. Antichi*, vol. xvii. Plate X.).

The representation of the divinity with the double axe is an insuperable obstacle to those who attribute the primitive idea of Zeus to the Aryan race; for the double axe appeared in the Mediterranean at a time so remote that it cannot be attributed to an Indo-German invasion.

4. VOTIVE DOUBLE AXES ON THE CONTINENT

With some modification of form the double axe reached Southern Germany. Dr. Much, in his book on the bronze age in Europe,[1] has a chapter with illustrations of these double axes. Their characteristic is that the cutting edge is on both sides parallel to the direction of the handle, and that the aperture for the handle is far too small to be used, whence Drs. Gross and Handellmanns[2] formed the opinion that these axes had served for the trade in metals or as units of value, and that they were strung together on a cord. That they did not serve as tools is proved by the fact that some have the edge blunted, others have the eyelet hole square or in the shape of two cones touching at the vertex. Professor Virchow, after making a list of the bipennæ of this form known in Germany[3] up to 1891, was not stopped by the extreme smallness of the hole through which it would be impossible to pass a handle, but asserted that the hole might be used for tying a handle to the side of the double axe. The circumstance that the edge of the hole is so sharply cut on the surface of the axe that a cord or strip of leather used to fix on the handle would soon be cut through is an obstacle to this theory. Dr. Virchow therefore ended by admitting that such a method of fixing on the handle would not be practicable, and

In Southern France we find many grave stelæ with the motto *Sub ascia dedicavit.* In 1738 Dr. Mazochi published a volume on the motto *Dedicatione sub ascia*, and even yet philologists are not in agreement as to the origin of this expression (Paulys, *Real Encyclopädie*, vol. i. p. 1522). This is probably the last record of the sacred axe as it appeared in the most ancient Minoan religion.

[1] *Zeitschrift für Ethnologie*, 1881, p. 47.

[2] *Verhandlung d. Anthrop. Gesellschaft*, 1879, Plate XVIII. Fig. 2.

[3] Virchow, *Zeitschrift für Ethnologie*, 1891, p. 460.

allowed that these double axes might be votive offerings. Now that votive double axes have been found in Crete, Troy, and Mycenæ, together with others having a large eyelet capable of being fitted with a handle, and which are, nevertheless, axes intended for cultus purposes, all the double axes, so made as to be of no practical use, which are of later date than those of Crete and Cyprus,[1] appear under a new light. Votive weapons were made in all styles and of all the commonest metals. I recall one axe of lead, which is in the Museum at Arezzo ; it is

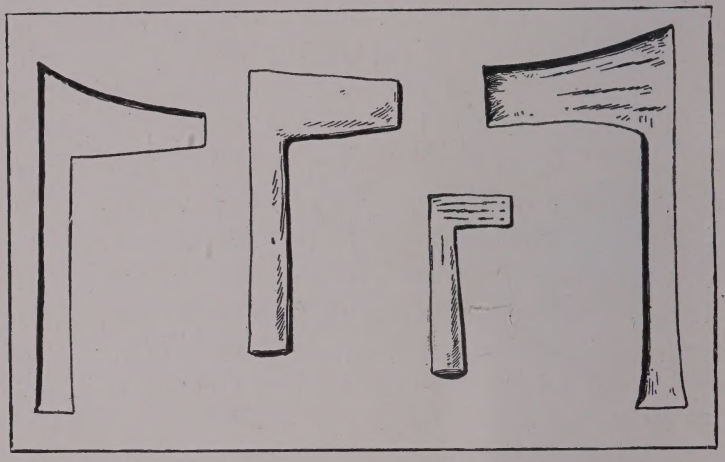


FIG. 83.—AXES AS A SYMBOL OF THE DIVINITY CARVED UPON THE MONUMENTS OF THE FIRST DYNASTIES IN EGYPT.

decorated with incised lines 3 to 4 millimetres apart, forming nearly rectangular zigzags which cover the whole surface of the axe ; the wings, too, which served for the handle are decorated in the same fashion.

5. AXES FROM AFRICA

M. A. de Mortillet has published several illustrations of axes with handles in his work on the sculptures of the megalithic monuments of France.[2] Similar weapons are found among the

[1] Perrot et Chipiez, *Histoire de l'Art dans l'Antiquité*, vol. iii. Phénicie, p. 867.

[2] A. de Mortillet, *Révue mensuelle de l'École d'Anthropologie de Paris*, 1894, p. 273.

neolithic rock carvings of the Ligurian Riviera, and some which were studied by Bicknell and Issel in the valley of Fontanalba are in shape like those of Egypt.[1] Dr. Montelius illustrates those found upon the stone of a tomb in Brittany on which are carved as a decoration ten axes with handles.[2] I think it unnecessary to give further evidence that the axe was already in the neolithic period a symbol of the divinity. What I have already given is enough to show the extension and the uniformity of religious conceptions in the stone age. But I cannot pass over some suggestive evidence which connects the civilisation of Egypt with Mediterannean religion. Dr. Petrie found at Naqada[3] some small stone axes which could be worn round the neck. Scarcely was the art of writing in existence than the axe was taken as a sacred symbol and carved as an image of the divinity upon the most ancient monuments of Egypt.[4]

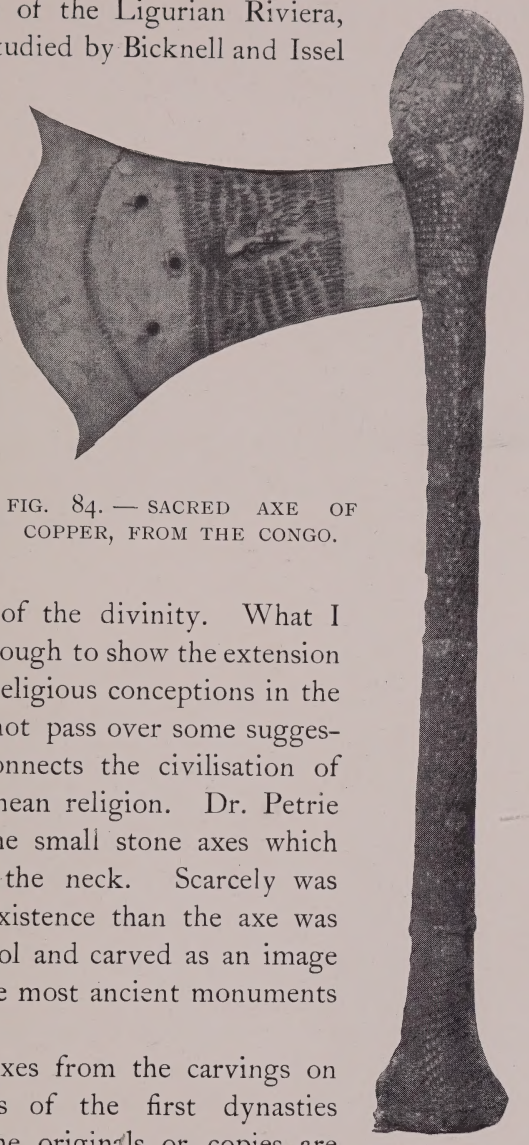


FIG. 84. — SACRED AXE OF COPPER, FROM THE CONGO.

I reproduce some axes from the carvings on the funeral monuments of the first dynasties (Fig. 83), of which the originals or copies are in the Museum or Turin. The religious beliefs which

[1] Bicknell, *Atti della Società ligustica di Scienze naturali*, 1897, p. 391.
[2] O. Montelius, *Die Chronologie der ältesten Bronzezeit*, p. 206.
[3] Petrie, *Abydos*, ii. Plate VII.
[4] Amélinau, *La Religion Égyptienne*, pp. 284, 306.

dominated the Mediterranean civilisation at its formation appear through these comparisons more homogeneous than the religious beliefs of modern Europe: this an unexpected fact which proves the long duration of primitive civilisation. The religion of the woman and the cult of the sacred axe form a net which encloses the whole of the prehistoric world. This sacred symbol penetrated even into the religion of Rome, and the axe of Mars in the Regia made known by its clash when the anger of the Gods threatened the city and it was necessary to appease them by expiatory sacrifices.[1]

FIG. 85.—SACRED AXE OF COPPER, FROM THE CONGO.

In the centre of Africa the remains of neolithic civilisation still flourish. The engineer Pietro Gariazzo, who lived several years on the Congo, told me that in some places (as at Kasai) it is impossible to make a deep and fairly large hole in the ground without finding sharp and well-polished stone axes of triangular shape, identical with the neolithic axes in our museums. Besides triangular copper knives like those of the Minoan age, he found among some tribes on the Congo votive

[1] De Sanctis, *Storia dei Romani*, i. p. 264.

axes still in use. Figs. 84 and 85 represent two of these axes, which he presented to the Museum of Turin. Both are of copper, with incised decoration on the surface. One (Fig. 84) has the handle covered with the skin of a serpent, and the other has the handle wound round with a spiral of iron. Signor Gariazzo does not know in what way these axes are used by the indigenes, but they were given to him as sacred objects. Judging from the iron axes which he bought at Kasai, he is inclined to regard them as distinctive signs of command carried by the chiefs in some regions of the Congo.

CHAPTER IX

STEATOPYGY

I. THE NEOLITHIC AGE

IN the Egyptian Museum at Turin there are five female figures, bought at Luxor by Professor Ernesto Schiaparelli. As they are the proceeds of clandestine excavations we are ignorant as to how they came to light. But judging from their character only they cannot be confused with any figures belonging to the historical period, and Professor Schiaparelli is convinced that these statuettes are prior in date to the Ist Dynasty.

Some of these figures in the excessive development of the thighs and posterior part resemble the neolithic idol of Phæstos which I described in a former article.[1] I illustrate one here (Fig. 86, A, B) rather less than the actual size, to show what a degree of simplicity had been reached in the stylisation of female figures intended for cultus use. It is of slightly baked clay, blackened in parts. On the mount of Venus the hairs are marked with incised dots; on the head the nose is barely indicated. I show the figure both in front and side view that its extreme simplicity can be seen.

The body is atrophied; the arms, thorax, legs, and head have been sacrificed to give more prominence to the generative portion of the anatomy. Religious sentiment was concentrated on this image apart from any erotic tendency; the idea of maternity was expressed in a pious and affecting manner.

[1] A. Mosso, *Memorie della R. Accad. delle scienze di Torino*, vol. lviii. May, 1904.

I think that neolithic female idols should be divided into two categories—fat women and normal women, which would probably correspond to two diverse ideas of the Mother Goddess representing Nature. The idol of steatopygous form which I found at Phæstos corresponds to the fat Goddess; such a woman is identical with those found by Tsountas in Thessaly.[1] On Plate XXXIV. Tsountas published a headless female figure

A B

FIG. 86.—PREHISTORIC EGYPTIAN IDOL OF UNBAKED CLAY.

with a large cylindrical opening where the neck connected with the head had doubtless fitted in, as may be observed in my statuette from Phæstos, so that even in this detail the correspondence is complete.[2] Drs. Petrie and Quibell, in a volume on Egypt,[3] repre-

[1] Tsountas, *Dimini e Sesklos*, 1908.

[2] Dr. Mariani describes a movable head which fitted into a trunk or an idol (*Monumenti Antichi*, vi. p. 169). Some statuettes found at the neolithic settlement of Butmir leave no doubt that they had movable heads which fitted into the trunk (*Die neolithische Station von Butmir*, Plate II. Fig. 6, A, B).

[3] Flinders Petrie and Quibell, *Naqada and Ballas*, Plate VI. pp. 13, 34.

sented five enormously fat women sitting in the same attitude as the neolithic statuettes from Malta, of which I shall speak later. One standing figure has an exaggerated prominence of the gluteal muscle. Two of these figures were found in a tomb in which the skeleton lay in the contracted position characteristic of the neolithic age ; in the same tomb was found the model of a boat 12 inches long, of unbaked clay, with some vases of neolithic type.

In the midst of good pottery these figures are made of pale coloured unbaked clay ; they are coloured red with black strokes on the thorax and sides, and also on the face. A female figure of

FIG. 87.—NEOLITHIC AMULET FROM CRETE.

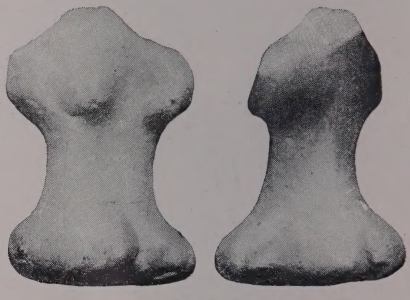


FIG. 88.—NEOLITHIC STEATOPYGIC FIGURE, KNOSSOS.

ivory carries a vase on its head ; others have upon the head a round cavity $\frac{1}{2}$ inch in diameter and more than 1 inch in depth. The idols of Cyprus, too, nearly all carry something on their heads. That the fat idols had a special significance may be argued from the fact that at Naqada figures of normal women were found [1] with the steatopygous figures. I illustrate here a neolithic amulet from the Museum of Candia (Fig. 87) to show the profile of a divinity in the form of a fat woman. This hard

[1] The subject of fat women has been studied by many. Among recent writers, Capart ("Les Débuts de l'Art en Egypte," *Annales de la Société d'Archéologie de Bruxelles*, xvii. 1903, xviii. 1904) and Paribeni ("La steatopigia in figurine preistoriche e storiche," *Bulletino di paletn. ital.*, xxiv. 1908). In Capart's book the grey earthenware statuettes are painted red and bear traces of a black decoration.

stone was probably worn at the neck, suspended by a string through the hole that pierces the head ; the drawing is rather less than the actual size.

For another neolithic steatopygous figure I have to thank Dr. Evans (Fig. 88). The head is broken and the arms end in the usual rounded stump, the abdomen and the breast are normal with an elegant profile. An incision marks the division of the gluteal muscles, which are much more developed than in a normal woman.

Fat women were found in the Mycenæan age, as may be seen

FIG. 89.—FIGURE OF A FAT WOMAN OF THE MYCENÆAN PERIOD, DISCOVERED AT PHÆSTOS.

FIG. 90.—NEOLITHIC FEMALE FIGURE FOUND IN THE CAVES OF LIGURIA.

in this figure (Fig. 89) from Phæstos, now in the collection of the Prehistoric Museum in Rome. It is of terracotta, with the arms folded on the breast. Figures of women were found by Don Morelli in the Caverna delle Arene Candide in Liguria, and I show one (Fig. 90) broken off at the waist and with the head broken. The modelling of the breast is perfect, and the slender waist, round which passes a cord in the form of a girdle, represents a normal profile.

Fig. 91, found at Haghia Triada, shows how the idols were made at a time which corresponds to the Mycenæan civilisation. Near it I show another from the same place, but not flat ; this

shows the archaicised form given to sacred images at a time when artists could do better things. Flat images like Figs. 90 and 91, without arms, are found in Sicily ; the two images found in Liguria are also flat. Others, like the idol of Phæstos and Fig. 92, have the form of the thorax normal. At Caldare, near Girgenti, I found at a depth of 1·60 metres in the black earth of a prehistoric village the female idol, Fig. 93. It is of light coloured clay, well baked. It is hollow, and open below, and the

FIGS. 91, 92.—SMALL IMAGES OF THE MYCENÆAN PERIOD, HAGHIA TRIADA.

sides are 20 millimetres in thickness. The figure is somewhat broken, with an elliptical section. From the base to the stump of the shoulder it is 105 millimetres in height, and there are three broken projections. The breasts are well made, and between them is a hole ; there is a similar hole on the side at the same height. A square opening, measuring 3 centimetres at the side, penetrates the trunk, and above it the head was fixed. Similar cylindrical figures representing a woman are found in Egypt of the neolithic age. Like the other idols they are painted with

brown lines. I illustrated one which has the hand upon the head.[1]

In the pile dwellings of Bosnia cylindrical female figures of terracotta were found,[2] which are probably later than the Minoan types of Gournià and Prinià; also other archaic Hellenic idols with cylindrical bodies have been found at Præsos and in Cyprus. Over the whole of Europe, as was the case in Crete, in the Aegean, and in Egypt, the neolithic figures

FIG. 93.—FEMALE IDOL FROM CALDARE, NEAR GIRGENTI.

are exclusively feminine. We must allow sufficient weight to this fact in order to comprehend the uniformity of religion. Even in the bronze age at Mycenæ male statuettes are extremely rare. At the neolithic station of Butmir, of about thirty figures which came to light (and were illustrated splendidly in two volumes) all are female with the breast well developed, and there

[1] "Idoli femminili e figure di animali dell' età neolitica," *Memorie Accad. Scienze di Torino*, 1907, Plate II. Fig. 17.

[2] Hoernes, *Urgeschichte des bildenden Kunst in Europa*.

is not one male figure. Some are steatopygous, and Dr. Hoernes considers that the appearance of female steatopygous figures in the south of Central Europe must be attributed to the stylistic influence in art which came from the south.[1]

2. THE EXISTENCE IN EUROPE AND EGYPT OF A STEATOPYGOUS RACE

The theory that the Mother Goddess was represented in two different forms, the fat woman and the normal woman, is complicated by the presence of steatopygous women in the interior of Africa, and by the preference for fat women shown by men in the East. We shall see that the present inclination of the African populations for fat women already existed in the neolithic age, and this atavism deserves to be recorded in the psychology of the peoples.

It is known that in South Africa and at the Cape of Good Hope the Bushman and Hottentot women present a great development of the posterior part. The sketches of travellers who describe these anomalous forms of the body[2] exactly resemble in profile the neolithic idol which I found in Crete and the Egyptian female figures.

Cuvier was the first to study the structure of this gibbosity in a woman who came to Paris in 1815, and who was celebrated under the title of the Hottentot Venus.[3] The autopsy proved that the enormous development of the gluteal muscle was due to hypertrophy of the fatty tissue, so that the stratum placed above the gluteal muscle and beneath the skin was above four fingers in thickness. To this characteristic development of the adipose tissue the term *steatopygy* has been given ; it is peculiar to women, and does not exist in men. This singular peculi-

[1] *Die neolithische Station von Butmir*, ii. 1898, p. 3.

[2] R. Blanchard, "Étude sur la steatopygie e le tablier des femmes Boschimanes, *Bulletin de la Société Zoologiques de France*, 1883, vol. viii. p. 43.

[3] G. Cuvier, "Extrait d'observations faites sur le cadavre d'une femme connue à Paris et à Londres sous le nom de Vénus Hottentote," *Mémoires du Muséum*, iii. 1817, pp. 259, 274.

arity is found also in other parts of Africa, among the Kaffirs, Somalis, and Berbers. Besides the development of the part above the gluteal muscle, a fatty mass has been observed upon the external surface of the thighs extending towards the knee, and forming a considerable prominence below the hips. This is a common thing in very fat women, and has also been observed in a similar figure of alabaster with very prominent hips, and the trunk set as it were upon two cylindrical columns, which was discovered in the neolithic soil of Knossos by Dr. Evans.

With a few exceptions, such as the female figures belonging to the Ist Dynasty described by Mr. Quibell,[1] and the others already referred to, women were represented with slender, agile figures. As Dr. Maspero says, in describing the female figures carved or painted on the Egyptian tombs of the Pharaohs : "the women always have the slender figure of a young girl." [2]

Among the publications on this subject epitomised by that most competent authority, Dr. Hoernes, in his "Primitive History of the Plastic Art," [3] I will only refer to the works of Piette and Salomon Reinach. Piette describes nine paleolithic female figures found in the South of France.[4] They are of ivory, and though they date back to a far-off age, when the mammoth and the rhinoceros lived in France with man, they are carved with an artistic feeling so exquisite, with so faithful an imitation of nature, that all the work of the artists of the neolithic age in Egypt and the basin of the Aegean is inferior to them as an anatomical study of the human body.

They were divided by Piette into two groups: "*les femmes adiposes, à seins pendants, à ventre volumineux*," and "*les figurines élancées à ventre plat.*" In the first group is a statuette called the Venus of Brassempouy, from the name of the place where it was discovered in 1892. It is distinguished by the exaggerated development of the bust, by the protuberant abdomen, by the

[1] Quibell, *Hierakonpolis*, London, 1900.
[2] G. Maspero, *L'Archéologie égyptienne*, p. 205.
[3] M. Hoernes, *Urgeschichte des bildenden Kunst*, Wien, 1898, pp. 46 and 192.
[4] Piette, "La Station de Brassempouy," *L'Anthropologie*, 1895, p. 128.

extraordinary development of the thighs, with steatopygy. The sculptor had also indicated by incised marks that this woman was more hairy than usual. In this fragment of ivory, 7 centimetres in height, the head and upper part of the trunk are wanting, and the thighs are broken above the knee. Another ivory statuette has also a great development of fat at the front of the thighs. The so-called *femme au renne* is included in this group, though she is not steatopygous, nor is the woman who is carved on the tooth of a horse. The other four figures described by Dr. Piette represent slender agile women. The work of Dr. Piette is important also for having shown that art in France began by modelling the female form, and that only later on was any attempt made at producing the figures of animals, but it is impossible to accept his opinion that these women represent a special race.

Dr. Salomon Reinach[1] has described a female figure of steatite, discovered in a cave at Mentone, which for its exuberant forms and the singular protuberance of the abdomen must be included in the group of steatopygous figures.

Dr. Flinders Petrie, M. de Morgan and others assert the existence of a steatopygous race even in the neolithic period. Dr. R. Virchow, too, in a lecture delivered at Innsbruck,[2] said that a race affected by steatopygy, like those now living in South Africa, might have entered France from Africa in prehistoric times. One fact must be taken into consideration before we accept such a conclusion. The Hottentot and Bushman women present a peculiarity in the structure of the generative organs which is not found in the statuettes just described; that is, the so-called *apron*, which has been fully illustrated by the French mission which early in the last century made a study of the regions of the South.[3] The *labia minora*

[1] Salomon Reinach, "Statuette de femme nue découverte dans la grotte de Menton," *L'Anthropologie*, ix. 1898, p. 27.

[2] *Mitth. Anthr. Gesellsch.*, Wien, xxiv. 1894, p. 135.

[3] Péron et Lesueur, "Observations sur le tablier des femmes Hottentotes," *Bulletin de la Société Zoologique de France*, 1888, vol. viii. p. 15.

have so extreme a development that they hang down between the thighs to the length of above 15 centimetres.

This deformity of the generative organs is not present in the ivory statuettes of the paleolithic age, nor is it observed in the female figures of the neolithic age. We must therefore find other explanations of the physiological and anatomical peculiarities which render the outline of these statuettes so different from that of the normal woman.

The sculptors of the female figures described by Drs. Piette and Salomon Reinach were too skilful as artists not to know that in copying from life they must reproduce the characteristic forms of the female organs which are associated with steatopygy.

Another great difficulty is the enormous geographical extension which would have to be allowed to this steatopygous race. This objection was in fact suggested by Dr. Hoernes, when he said: "It will probably not be asserted that wherever steatopygous figures are found, a people with this characteristic must have lived."[1] Besides the existence of women of the Bushman and Hottentot races who may have served as models for the female figures just described, there remain other questions: the prevalence of fat women, stylisation, and the religious sentiment which is reflected in these female idols.

In the "Descent of Man," Darwin makes some remarks in his chapters on sexual selection, which perhaps serve to explain the origin of steatopygy where this is produced, and the exuberance of female forms in primitive art: "It is well known that with many Hottentot women the posterior part of the body projects in a wonderful manner; they are steatopygous; and Sir Andrew Smith is certain that this peculiarity is much admired by the men. He once saw a woman who was considered a beauty, and she was so immensely developed behind, that when seated on the ground she could not rise, and had to push herself along till she came to a slope. Some of

[1] Hoernes, *op. cit.*, p. 192; Albert Mayr, "Die Vorgeschichtlichen Denkmäler," *Abhandl. der phil. clas. der K. Bayrischen Ak. d. Wissenschaft*, München, xi. 1901.

the women in various negro tribes are similarly characterised; and, according to Burton, the Somal men are said to choose their wives by picking her out who projects farthest *a tergo*, nothing can be more hateful to a negro than the opposite form."

3. FEMALE STATUETTES FROM MALTA FROM THE NEOLITHIC TO THE MYCENÆAN AGE

Arabs and negroes prefer fat women, and this explains how similar types of beauty should be found in prehistoric times without it being necessary to admit the existence of a special race inclined to steatopygy. Dr. Paribene has recently criticised my opinion on steatopygous women.[1]

His hypothesis of a Northern Mediterranean race which, after constantly losing ground was obliged to return to Africa to end in the interior of that continent, does not convince me. To suppose that before the neolithic strata of Phæstos and Knossos in which steatopygous women are found, there should have been a race which from the Northern Mediterranean came to Crete and Upper Egypt and as far as Nubia, is an audacity to which I cannot agree, for no proof can be shown of such an inversion of the currents which diffused civilisation in the Mediterranean before the beginnings of history. The chief difficulty lies in the anatomical fact that the fat women in question differ from the steatopygous women who still exist in the interior of Africa. Dr. Paribene does not answer this objection with any arguments that convince me, but I recognise the importance of Dr. Paribene's contribution to this problem, containing as it does one figure of calcareous stone and one of terracotta of fat women found by him in the excavations of Adulis in the colony of Erythrea, of the fifth or sixth century A.D.

Dr. Paribene's article, in spite of the difference of our interpretation, confirms the distinction between fat women and

[1] Paribene, *Bullettino paletn. italiana*, xxxiv. 1908, p. 73.

steatopygous women, for the figure published by Dr. Paribene is a fat woman who has nothing in common with steatopygy either in the form of the genital organs or the cushion of fat upon the posterior part. If Dr. Paribene's theory of the northern origin of steatopygous women is to be accepted, other figures must be discovered like that from Phæstos, but much more ancient, ancient enough to give time for this race to reach Crete and Egypt.

Seven figures of fat women of the neolithic age were found in Malta and described by Dr. Mayr, and later, as I have said, other similar statuettes of the Mycenæan age came to light. I

FIG. 94.—FEMALE FIGURE, FROM MALTA.

illustrate one (Fig. 94) to show the type of these women. The figures are made of local calcareous stone, and this is significant, for it might have been supposed that figures so strange had been imported. Now we know that this deformity had its origin in a local belief which inspired the artists to make these statuettes for purposes connected with the cult. The morbid fatness deforms the thighs and belly, and in some of the figures the seat has become like a huge globe, from which grow two small excrescences representing the legs, and above this is the slender body of a woman with her arms crossed upon her breast. Nearly all are naked and seated on the ground or upon an oval base. Some who are upright have their hands upon the thigh,

those who are clothed have only a simple skirt. In two figures there is a hollow, as in former figures, where the head was fixed on to the trunk by a small hole, or they have a cylindrical opening in which the neck is fixed like the neolithic figure of Phæstos. The arms, which terminate in a conical stump, also connect these figures with others of the Minoan age described by Dr. Halbherr. One of these women, with the arms made in this fashion, will be found in the chapter on votive figures. I record these details because they are interesting as showing the stylistic influence which lasted in Malta from the neolithic age to the Mycenæan period. Other statuettes of clay and of stone have recently been discovered in Malta, two, with the breast bare and wearing skirts, are steatopygous figures of the Mycenæan type; this confirms the theory of the two types representing the Mother Goddess, which passed from the neolithic age down to Mycenæan times.

CHAPTER X

VOTIVE FIGURES

I. VOTIVE FIGURES IN THE NEOLITHIC AGE

WHEN we see human figures of wax or silver, brought as *ex votos* by the faithful, upon the altars, round the pictures and statues of the Madonna and the Saints, no one thinks that this custom already existed in neolithic times, when worshippers offered their own image to the divinity. The tangible figure of the person who prayed gave more solemnity to the offering. Here we are beyond the confines of history, and we see with wonder that man had then the same tendencies as to-day. The psychology of the supplicant to the divinity has remained the same even in the Catholic religion. From Dr. Schliemann's excavations at Troy there came to light more than seven hundred pieces roughly cut out in the form of a human figure, from thin layers of marble, terracotta, or bone—so coarsely made that the head can scarcely be distinguished from the trunk.[1] They are small, not above a decimetre in height, and some are only a few centimetres. On some there are lines which mark the hair on the heads, and others have round the neck two or three rows of a necklace. The characteristic of these figures is that there is no indication of sex, while, as we have seen, all the idols are female.

Dr. Evans has kindly allowed me to publish one which was discovered by him in the neolithic soil of Knossos (Fig. 95).

[1] Schliemann, *Troy*, p. 290.

This rough sketch of a human figure is so simple that it is almost unrecognisable. The head is reduced to a conical projection upon a square body, on the lower part having an incised mark to indicate the division of the legs.[1] In many of them Dr. Schliemann would not have recognised the outline of a human being if he had not had before his eyes the whole series of seven hundred similar pieces.

The forms which Dr. Schliemann took for a symbol of the protecting divinity of the place are the images of the worshippers, and are found in Egypt, in the Aegean, and on the Continent of

FIG. 95.—NEOLITHIC VOTIVE FIGURE, KNOSSOS.

FIG. 96.—NEOLITHIC VOTIVE FIGURE, FROM SICILY.

Europe. Fig. 96 comes from Stentinello, near Syracuse, and belongs to the neolithic age.[2] In Spain, too, there exist figures of the late neolithic period in which one can with difficulty recognise the outline of a human being cut out of a sheet of schist or other stone.[3] The recent publication of Professor Tsountas[4] confirms the existence of images, which are either

[1] Rather less than the actual size.

[2] Professor Orsi describes it thus : It is a cylindrical torso flattened at the shoulders, with thin neck without head or arms. The shoulders are indicated by two protuberances (*Bullet. paletn. ital.*, xvi. 1890, Plate VI. 14).

[3] H. L. Siret, *Les premiers ages du Métal dans le sud-est de l'Espagne*, Anvers, 1887, p. 33.

[4] Tsountas, *Dimini e Sesklos*.

votive images or figures of the worshippers, in the neolithic age in Greece.

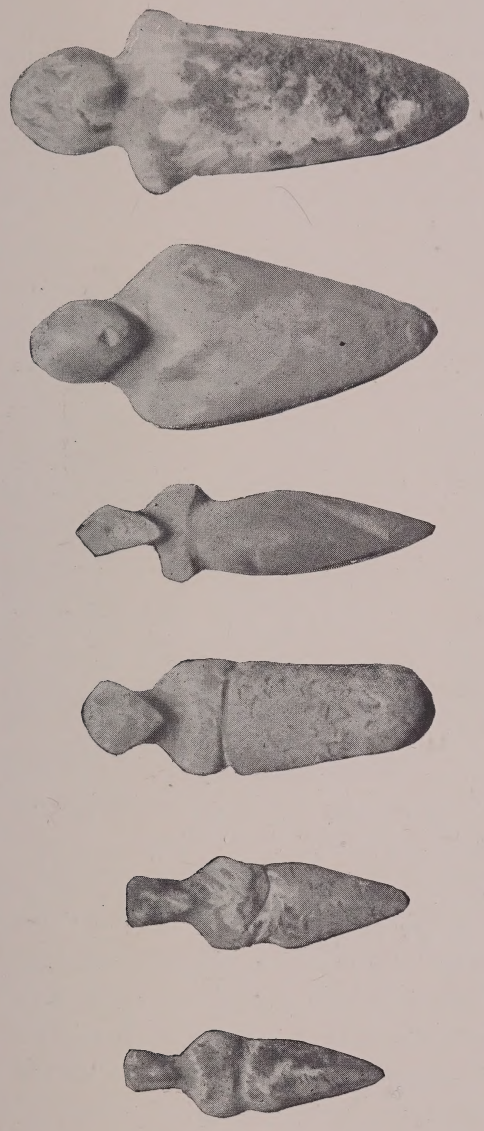


FIG. 97.—SIX MALE VOTIVE FIGURES FROM THE GREAT "THOLOS" OF HAGHIA TRIADA.

2. VOTIVE FIGURES IN THE COPPER AGE

An abundant and varied collection of similar figures came out of the great *tholos* of Haghia Triada, described in Chapter VI.

They are of marble, alabaster, or steatite, and form useful material for the study of art in the age of copper, especially as they differ from the contemporary figures in the Cyclades.

The six figures of Fig. 97 are absolutely different in appearance from the female idols. As they have pointed chins and an indication of the beard we must believe them to be male figures. The figures 98 A and B, which present more likeness to the human body, are male also ; one has a belt and the other a small

A B

FIG. 98.—VOTIVE FIGURES FOUND IN THE GREAT "THOLOS" OF HAGHIA TRIADA.

loin-cloth.[1] They are of bone, and I believe them to be male, for otherwise the sculptor would hardly have neglected to indicate the breasts. These essays at modelling show how much more advanced was art in Crete than in Italy. Nothing of the kind is found in the terremare, though they were at the bronze age, while here we are scarcely in the age of copper. Very characteristic too are the three women who wear a mantle on their shoulders (Fig. 99). To show the connection of the art of

[1] Perizoma.

Egypt with that of Crete I give an illustration of a figure of a woman (Fig. 100) belonging to the neolithic age, and found in Egypt by Professor Schiaparelli, who kindly gave it to me. It is of bone, like the former figures, with this peculiarity, that the feet are seen projecting below the gown. A woman wearing a similar mantle was on the disk found last year by the Italian Archæological Mission in the excavations made at Phæstos by Dr. Pernier.[1]

Of much importance as regards the chronology of the great

A B C

FIG. 99.—THREE FEMALE FIGURES WEARING A MANTLE, FOUND IN THE GREAT "THOLOS" OF HAGHIA TRIADA.

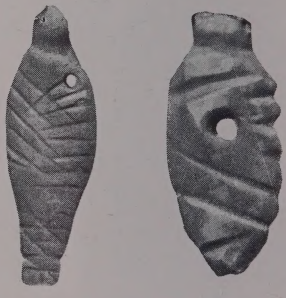
tholos of Haghia Triada, and the relations of Egypt with Crete, is the discovery made by Drs. Petrie and Quibell[2] in the Egyptian tombs of the neolithic period, of some figures which are exactly similar to the six Cretan ones of Fig. 97. They are of ivory, bone, marble or clay (in some tombs there were two or three together), and the head is made in the same fashion with a pointed beard.

[1] Pernier, "Il disco di Phæstos," *Ausonia*, iii. p. 155 *et seq.*

[2] Petrie and Quibell, *Naqada and Ballas*, Plate LIX.

In the *tholos* of Haghia Triada there were among the skeletons some figures of bone with a hole, which probably served for suspending them round the neck, and which are made in the shape of mummies or corpses wrapped round with bandages. I reproduce two of these amulets (Fig. 101, A, B), and compare

FIG. 100.—PREHISTORIC FIGURE OF BONE, DISCOVERED IN EGYPT, RESEMBLING THE FEMALE FIGURES FROM THE "THOLOS" OF HAGHIA TRIADA.



A B

FIG. 101.—A, B, AMULETS REPRESENTING A MUMMY, "THOLOS" OF HAGHIA TRIADA.

them with three others now in the Egyptian Museum at Turin (Fig. 102, A, B, C). A and B are of bone, and similar to those from Haghia Triada. Here we have fresh evidence of the cult of the dead. These figures, representing the bodies of dear dead persons, wrapped in bandages of linen, as at the time of burial, help us to understand the psychology of the primitive peoples. We are less faithful to the remembrance of the funeral ceremonies,

and the sight of a coffin hung on a necklace as a pendant would excite our disgust. Fig. 102, C, is of red calcareous stone, and is derived from the preceding forms. Various explanations might be given of the significance of these figures. They were simply votive images, by means of which those who were near in life desired to remain in the company of the dead, or they were amulets like the two mummies which were worn in memory of a

A B C

FIG. 102.—AMULETS FROM EGYPT, RESEMBLING THOSE FROM HAGHIA TRIADA.

dear one, or possibly the image of the double, a belief in which was maintained by the Egyptian religion. The cemetery discovered by Dr. Evans near Knossos has taught us the beliefs and the funeral rites of the Minoan people, but in no tomb has the image been found of the double which always exists in Egyptian tombs. The great *tholos* of Haghia Triada establishes a more intimate connection between Minoan art, predynastic Egyptian art, and Africa. The figures of the monkeys published by

Halbherr are identical with the monkeys of the neolithic Egyptian tombs excavated by Mr. Quibell.[1] These monkeys, like the elephant and other animals, are figures which make one look towards Africa as the cradle of Minoan and prehistoric Egyptian civilisation.

FIG. 103.—VOTIVE FIGURE, MALE, FROM HAGHIA TRIADA. ACTUAL SIZE.

FIG. 104.—FEMALE VOTIVE FIGURE, MYCENÆAN PERIOD, FROM HAGHIA TRIADA.

3. VOTIVE FIGURES IN THE MYCENÆAN AGE

The earliest male figures known in prehistoric plastic art are among the idols of the Cyclades. I saw some in the Museum at Athens, but they are very rare. Votive figures continued in vogue during the Mycenæan period, and this one from Haghia Triada is the only one I know with a sign of virility. It was found with a female figure (Fig. 104—now in the Prehistoric Museum in Rome), with conical arms like the neolithic idols of Malta. It has petticoats decorated with red lines, an uncouth head of very coarse work in comparison with the splendid little

[1] Quibell, *Hierakonpolis*, ii. 5

bronze figure reproduced in my book,[1] which fills one with wonder at its resemblance to the modern outline of a fashionable lady.

Beside the sacral horns and the idols in the domestic sanctuary at Knossos, Dr. Evans found two votive statuettes,[2] one of them with the arms raised and the hands joined near the mouth in a position so full of concentration that a modern artist could do no better as a representation of prayer: such was instinctively in all time the attitude of a devotee imploring divine help. That the terracotta figure found by Dr. Evans in the shrine of Knossos had been placed on the altar by worshippers to preserve the memory of their act of devotion is proved by the position of a figure which turns its head to one side to contemplate the symbol of the divinity beside her. These statuettes of the worshippers were made after an archaic type, just as the figures of the idols were. This religious tendency led Dr. Schliemann into error, for when he had found some human faces like those of birds,[3] he thought they were really heads of owls, and supposed that the city of Troy was dedicated to Athene—no one now believes either of these things. The same human face with the beak of a bird is found very commonly in Italy in the neolithic age and through the first dynasties. In Crete, too, it is often found, and it is difficult to distinguish whether it is owing to the want of skill or to the haste of the modellers, or whether they did not care to make images by the dozen.

Human faces with the appearance of owls are found, too, at Butmir in the deposits of the neolithic age; and the beak of a rapacious bird, substituted for a nose by the caprice of the modeller, is seen on the man standing in the neolithic vessel of Fig. 152, in the chapter on navigation.

Without troubling ourselves about creeds, we can see that the psychological type of the religious man from the neolithic age up to our own day has remained constant and unchanged. Modern

[1] *Palaces of Crete*, p. 69, Fig. 26.

[2] A. Evans, *Annual of British School at Athens*, viii. Fig. 56.

[3] *Ilios*, 328, Figs. 157, 158, 227, 229, 231, 237, &c.

writers who speak of evolution (and, still worse, those who assert an actual dissolution of religious thought) are unaware that European civilisation appears at the outset with an aureole of lofty religion free from fetishes and pure from all vulgar defilement.

Religion, which was the philosophical synthesis in the dawn of civilisation, will last eternally, just as the mystery of the world will be eternal. Minoan religion, though one of the most ancient of religions, was positive and ideal. Myths, dogmas, and rites may vary, but the basis of religious thought remains the same, because it rests upon the unknowable and upon fate. It is vain glory, or a dream, to believe that we are assisting at the evolution of the religious idea.

CHAPTER XI

THE ORIGIN OF ART IN RELIGION

I. EMBRYOLOGY OF ART

IT has been believed that the first artistic objects were ornaments. This may be true, if we are only considering pottery; but, as regards plastic art, it has gone through a process of mental evolution far higher than the futile pleasure of decoration. It has transfused into material objects the affections and most intimate thoughts of the primitive people, and is the expression of their philosophic sentiment, and, as it were, the tangible form of religious abstraction, whence it may be asserted that art and science are at their first appearance indistinguishable.

At the beginning the first subjects modelled by artists are idols and their worshippers. This is the same psychological fact with which the art of Greece began; in Italy, too, in the Quattrocento and the Renaissance, the artists remained enclosed in the narrow limits of religion and mythology. The study of neolithic civilisation has also shown that modelling and sculpture preceded drawing and the flat carving of figures. Statues were earlier than sculpture in relief, because to trace an outline or to project it on a flat surface is a more complex thing than to form the whole by means of clay. At first sight this seems contrary to our usual methods of education; but it was not so in the neolithic age, when we find female idols modelled at a time when no representations of the most simple natural objects, such as leaves, branches, and flowers, are found on the pottery.

The two fundamental problems of philosophy, "whence do we come and whither do we go," had already presented themselves to the men of the neolithic age with the same mystery and the same intense emotion; and art blossomed forth for the adoration of creative nature and the sorrow of death. By the study of the conditions under which the first works of art were produced we shall collect evidence for the benefit of the critics who follow the guidance of history, as well as for those who follow the lead of philosophy. It is the extinct forms of art which help us to know the hidden springs whence the sense of beauty arose, and these researches will be as palæontology to zoology.

It has been said that art is the childhood, not chronological, but ideal, of man. With this idea one might suppose that plastic art at its first appearance had the impress of ingenuousness and childishness; but we find that it appears at once with conventional characters and virile sentiments. In the theory of art in connection with beauty, it is asserted that the first inspiration came from reality, and that aesthetics are an abstract intuition of the beautiful without the participation of the senses, and that artistic sentiment can be joined to reality without altering it; but we see in the female idol from Phæstos that from the first appearance of art man impresses upon the outline of the human form his own individual tendencies by certain alterations of the common type, which satisfy the senses or pervert them. It may seem to some people extravagant to attempt to solve the problem of art by the help of so rude a figure; but, as in the study of embryology the outline of the human embryo is not what it will become in the future, so in these early attempts we find art in its fœtal stage.

While admitting that the now existing [1] collection of neolithic images form an insufficient material for the study of the origins of art, it will not be without profit to consider the subject, knowing as we do the conditions of the ground where the first flowers of art have unclosed. A memorable attempt was made

[1] M. Hoernes, *Urgeschichte der bildenden Kunst in Europa*, Wien, 1898.

by Taine when he tried to assimilate the history of art to a branch of natural science;[1] but he omitted to consider the question of primordial society. Recent excavations have made it possible to study the psychology of the people while yet in its infancy, by means of plastic evidence, and to describe the surroundings in which the germs of art were developed.

Aesthetics, as a philosophical doctrine, cannot be separated from the first manifestations of the social life of which it forms the essence. Art does not come into being as an individual and independent effect; it is the result of a series of determining causes, in which the will of the artist yields to the conditions of his surroundings and to the collective will dominated by religious sentiment. The work of the primordial artist is the voice of a whole generation, and like an echo which repeats and causes to be repeated the stirrings of a people; it is the consent of the souls, not inspired by any desire to co-operate in the formation of beauty, but solely preoccupied with their own destiny.

The cult of the woman was the characteristic of neolithic art. From the first origin of art till the age of bronze no one thought of investing clay with the form of a man. This proves that matriarchal religion had uncontested sway in the field of aesthetics. And the fact that this exclusively feminine art was diffused over the whole basin of the Mediterranean demonstrates both the ancient unity of religion and the very long duration of neolithic civilisation.

2. THE LAW OF UNIFORMITY IN PLASTIC REPRESENTATION OF WOMAN AND THE DOMESTIC ANIMALS

The much-discussed motto, "*Art for art's sake*," becomes a sterile formula now that we have seen how art, before all other subjects, represented religious thought. Uniformity in the plastic representation of woman and of domestic animals in the primitive world is a fundamental law in the development of art.

[1] Taine, *Philosophie de l'Art*, 1865; *De l'idéal dans l'Art*, 1867.

Nor was the inspiration of the earliest artists influenced by sensuality or the voluptuous images which pervert degraded races of mankind.

The absence of pornographic objects in primitive art is a sure testimony to the elevation and purity which were from its birth proper to the Mediterranean race, so that morality and religion flowed abundantly upon the roots of its social existence. Charles Darwin,[1] speaking of sexual selection, notes that the female exercises a preponderating influence, because the brilliant colours of the plumage of male birds and their more musical song are masculine attributes which have been developed by female selection. Matriarchal religion had its origin in instinct, and is a tribute of devotion rendered by primitive man to woman, and not, as many have believed, the fruit of early corruption of customs.

The statuettes found at Heliopolis by Professor Schiaparelli in neolithic soil (8 metres below the present level of the ground), and those of the Ist Dynasty excavated by Dr. Petrie at Abydos, are identical with those of Crete and Italy. From Egypt to Butmir, in Bosnia, the first animal represented is a bull. The law of uniformity in the representation of woman and of animals in the neolithic age becomes important for historical criticism in the psychology of the people. Ethnical differences were in the beginnings of art less apparent than they have since become with the progress of culture. We might apply here the law formulated by Spencer, that evolution is the product of an increasing differentiation.

The much-discussed question of the influence of surroundings and race upon the development and bloom of art is a subject that can be studied even in prehistoric times. As in the embryo there is a stage in which all the cells are equal, and then they change gradually, to supply the various organs of our body, so there was in Mediterranean civilisation and over the whole of Europe an embryonal state of society, in which the marked characteristics of the people, as now manifested in art,

[1] C. Darwin, *The Descent of Man*, vol. ii. p. 50.

were absent. Mental evolution and social elevation were a very difficult process which lasted hundreds of centuries. And at last the blossoming of art almost at the same time and manner, with the same inspiration and identical products, in so many parts of the ancient world proves that the inventive genius of man is very limited.

3. THE FIRST ARTISTS OF SOUTHERN FRANCE

Art, at its first appearance, is not an effluvium which is equally diffused among the human race; but there have been from the beginning centres of irradiation whence the fire of art sparkles and spreads, and the pressure of this energy is transmitted to surrounding countries. Thus we see, for example, in Southern France, and later at Butmir in Bosnia, that during the neolithic age art reached a great development in limited provinces and limited times, as happened during the Renaissance in Italy, and later in Holland, and before this, in Athens.

It is well known that generations of artists lived in Southern France with the mammoth and the reindeer. Their drawings, incised with simple stone points upon pebbles, upon the tusks of the mammoth and the horns of the reindeer, are so true, so perfect that nothing has as yet been found in the prehistoric East to compare with them. A dying reindeer, some horses' heads, are real wonders of art. These marvellous objects, found in the caves of Southern France, were already known when the attention of archæologists was attracted by the carvings and paintings on the walls of the caves.

The artistic centre was moved more to the south by these new finds. Out of twenty decorated caves, eight belong to Spain. Here, too, is the hand of skilful artists, who were not satisfied with simply scratching the outlines of animals and of man on the rock walls, but made use of red, yellow, and black colours to give more effect to their pictures. In the caves of the Dordogne are represented extinct animals such as the mammoth, while in the caves of the Pyrenees and of Spain the paintings are more especially of the bison and the horse.

The splendid reproduction in colours[1] of these paintings enables us to admire the paintings of the Cave of Altamira. The bison, both in design and colour, produces a deep impression both by the truth of the attitudes and the wonderful study of life. It is difficult to believe that these masterpieces belong to the paleolithic age, as is maintained by the authors of the book. On the origin of this art there are two opinions. Some consider it to be autochthonous, others derived it from the East. It was asserted at first that the people to whom these great artists belonged were a quaternary race, but now it is recognised that they were a neolithic people and they are no longer thought to be autochthonous.

The difficulty of these archæological studies depends on geology, for the fact that these primitive artists lived with the mammoth and the reindeer gives them a sufficiently remote date to make it possible that they should have belonged to a special Western race, which, however, it seems does not exist.

4. THE CLIMATE OF PREHISTORIC EUROPE

One need not be a geologist to know that there was a glacial period, and that Europe had so cold a climate that the glaciers of the Alps came down to the Po. The ancient moraines extend far along the foot of the Alps, specially on the Swiss side, and occupied a large extent of space where no glacier now reaches. And so in Northern Europe there was a great mass of ice, which extended with its moraines nearly to the Black Forest and the Thuringian Forest. One of the grandest spectacles of the Lower Alps, beginning from the valley of Susa, is presented by the traces of the last glacial period. On leaving the valley of Aosta we see one of the finest moraines in Europe (the so-called Serra), several kilometres in length and of perfect regularity, with the line sloping towards the south; and everywhere, a few miles from the Lake of Orta to Lake Maggiore and Lake Varese, we find the terminal moraines of prehistoric glaciers.

[1] Cartailhac et Breuil, *La caverne d'Altamira*, Monaco, 1906.

Plants and animals felt the influence of these great variations of climate. In the quaternary districts geologists distinguish four glacial periods, and man was in existence during this severe modification of the climate. The plants of the South moved towards the North when the ice moved back, and Alpine plants invaded the Southern lands, taking the place of the flora of hot countries when the glaciers advanced. There was an advance and retreat four times repeated. We see this in the remains of Southern plants, and we deduce it from the fauna. When another recrudescence of the climate came and the glaciers began to extend again, the plants again took on an arctic appearance; animals more suited to life in cold countries increased, and boreal animals came down to the Mediterranean. The tombs which contain red ochre as well as the bones of the reindeer prove themselves contemporary, but we do not know if they are earlier than the other neolithic tombs of Europe. Some bones of reindeer are found in the Ligurian caves, and the presence of the sea is an indication that the temperature here was not glacial. However this may be, the reindeer, before it disappeared from Southern Europe, must have become used to a much milder climate than that in which it now lives. The frequent great changes in the temperature of Europe, before the present equable conditions were established, explain why among the animals now only found in Southern countries, such as the lion, hippopotamus, rhinoceros, elephant, &c., animals from cold countries, such as the marmot and reindeer, should have been found in Central Europe. The same thing might be said of the mammoth, if it became extinct it was not for want of cold, for it lived in Siberia, where it has been found intact in the ice; nevertheless, its species has become extinct after having lived in Europe and Northern Asia. There have, therefore, been other factors which rendered this species degenerate and sterile. On the other hand, we have the fact that the rhinoceros and the elephant have lived in the glacial climate of Europe.

In special circumstances, as Darwin tells us,[1] animals possess

[1] Darwin, *Origin of Species*, p. 154.

great elasticity of constitution, and can accustom themselves to extremes of climate, but in the long run they succumb, and only prosper in the climate adapted to their constitution. Domestic animals, on the other hand, bear the greatest diversity of climate and still remain fertile.

We cannot therefore attach great importance to the presence of the mammoth and the reindeer, for they may have been able to resist a climate somewhat different from their natural one till they gradually died off.[1]

The resemblance between the most ancient female figures in France and the neolithic figures of Crete and Egypt is very striking. The fact that there are only women without arms, flattened and steatopygous, cannot be an accidental thing. The girdle, the Egyptian mode of hair-dressing in some of the neolithic statues in France, the finding in the tombs of the same red colouring of iron with the pebbles and shells which were used for pulverising it for use in colouring the skin, the signs in primitive Mediterranean writing, and many other circumstances will convince the most reluctant that the art and civilisation of France were not autochthonous, but while being the most ancient layer, they form part of the genealogical tree of neolithic civilisation.

There is now a decided tendency to lower the date of the first artistic remains in France. It is enough to quote Sophus Müller[2] who brings them down to 5000 or 6000 B.C. French archæologists are not all agreed in yielding their precedence in the field of art. The threads which wind round the neolithic world are becoming ever more evident, and the primitive centre of art has been removed towards the West, the fact being uncontested that no people have approached the mastery of the French in the beginning of the neolithic age. Four or five thousand years

[1] The studies recently made in Africa and France by Delmat (*Bulletin Soc. Dauphinoise d'Ethnol. et d'Anthr.*, ix. 1902) and Gautier (*L'Anthropologie*, xv. 1904) allow us to suppose that there has been a connection between Africa and France, from which arose this style of art in the stone age.

[2] *Urgeschichte Europas*, p. 8.

before Christ the Egyptians had already invented writing; but the neolithic age of Egypt and of Crete is certainly many thousand years older. For that reason King and Hall assert that in the ice age, when the mammoth lived in Europe, the banks of the Nile as well as Upper Egypt were already inhabited by man.[1] Professor Sergi, whose authority is great on the history of prehistoric Europe,[2] is of the same opinion, and writes that an African origin is possible for art in sculpture and carving, as may be seen in the caves of France and other European stations.

5. NEOLITHIC ART IN THE WEST

In prehistoric times the climate was less cold in Italy than the rest of Europe, and only near the Alps do we find traces of the glacial periods. This diversity of climate between Italy and the countries beyond the Alps renders a chronological comparison of the neolithic period in Italy with that of Central Europe somewhat difficult; it does not, however, prevent an acknowledgment of the inferiority of the artistic productions of Italy to those of France and Spain. The skill displayed by the sculptors of the latter countries was marvellous. Faithful observation and the study of nature are the chief characteristics of this primitive school, in which incomparable artists seized the real attitudes of the animals which served as their models. The caves with painted walls are mostly in the valley of the Vezère, in the part called La Madeleine, where sculptures on ivory, bone, and stone have come to light.

The same thing happened with regard to Western art as has been the case in several other chapters of palæethnology, when the first basis was found this was widened as research extended; so that we have seen the civilisation of La Madeleine reach the North of France and even Belgium. Switzerland, among other caves, can boast of that of Kesserloch,[3] near Schaffhausen, where

[1] King and Hall, *Egypt and Western Asia*, London, 1907, p. 5.

[2] Sergi, *Europa*, p. 196.

[3] Hejerli, "Das Kesserloch," *Neue Denkschriften der Schweizer Natürforsch, Gesel.*, 1907, xliii.

a carving of a reindeer grazing was discovered (considered by everybody to be one of the best drawings produced in the stone age). There were also figures of horses, stags, and other animals carefully carved from nature upon the branches of a reindeer's horns. At Brünn, in Austria, too, sculptures were found—the designs being carved on the tusks of the mammoth like those in France. The cradle of the artists of the age of the reindeer was not limited to one country, and the reign of art extended over a great part of Central Europe, but the blossoming of this primitive art did not reach beyond the Alps. The folk who practised it were tribes of hunters who lived in a cold climate and probably carried on no other trade but that in stone weapons.

We know not what caused this civilisation to end without leaving heirs. The age of metals is much later, and in it the movement was from South to North. We must not, however, forget that such knowledge has only a relative value, and that at any moment fresh excavations may modify prehistory. It is enough to remember what happened in the case of the swords. Professor Virchow had noted with surprise that no swords had been found in the East—this was a good argument to prove that civilisation had come down from the North. But a few years later the most ancient swords were discovered in Mycenæ and Crete ; and in the Museums of Athens and Candia are two splendid collections of swords, which are the admiration of the artist and the archæologist for the chiselling and inlay upon the blades of bronze, and for the carvings which adorn the handles of ivory and gold. To-day it seems as if the artistic populations of beyond the Alps must be older than those who lived in Italy and Greece ; but a discovery may be made which will invert this order and prove what seems most probable, that the populations of the South are the more ancient.

The development of art in France, Spain, Crete, and Egypt points to a common origin of art ; for even in France sculpture, with complete reproduction of the forms, preceded flat carving in the representation of men and animals.

The statues are in France, too, all of women : the clothes are the same, the disposition of the hats on the heads, the girdle, the absence of arms, and steatopygous women are mixed with normal women.

The figures of the age of the reindeer present a conventionalism, according to the Abbé Breuil,[1] with such progressive simplification of the forms that the outlines of some animals, used for decorative purposes, end by becoming unrecognisable. This degeneration is also observed in the rock carvings representing bovine animals in the Alpes Maritimes, which have been studied by Professor Issel. The palæethnologists agree with Dr. Reinach in considering this conventionalism as the effect of religious manifestations. If this hypothesis be true, we should have a new bond between the art of the East and of the West in the representation of animals for sacred purposes.

It remains a mystery in the History of Art that in the Classical East there is no picture representing with truth a great collection of animals, such as that in the cave of Altamira (in the province of Santander, Spain). The existence of this monument in a region rich in minerals and at no great distance from the shores of the Atlantic, suggests a connection by sea with other artistic centres not yet discovered. However this may be, not even the Greek artists of the best period have shown equal freedom in the drawing of animals. There are bisons which jump and horses galloping in the paintings of Altamira which remain unsurpassed models of realism. The outline, drawn with skill, has been completed by polychrome colouring, in which we can see the brush marks and the scraping to give relief, with lighter touches the better to indicate some point of the body. The fact that the decorations are made at the top, on the vault of the cave where no light penetrates, renders more poetic these manifestations of art, which seem to have been inspired by religious sentiment.

[1] *Académie des Inscriptions* (*Comptes rendus*, 1905, p. 105).

6. RITUAL DANCE AT COGUL

Paintings representing animals such as the mammoth and the reindeer have been discovered in the caves of France and Spain. Rock paintings similar to these, which were at first attributed to the quaternary period and the palæolithic age, have had a date nearer to our own time assigned to them, and those last discovered in Spain in the basin of the lower Ebro seem to have some connection with the Minoan civilisation. The Abbé Breuil and Don Juan Cabré Aguila[1] have recently made fresh discoveries of rock paintings, and one of these, near Cogul, in the province of Lerida, Catalonia, represents a dance in which nine women, four on one side and five on the other, appear to be dancing round a nude man. If there is no exaggeration of the perspective, the man is smaller than the women. Two of them who are walking away from this scene are painted in black, the third has a black and red dress, with oblique lines indicating flounces on the skirt. The four women on the right side of the picture are also painted in various colours. If we may judge from the violent movement of the arms, this scene must represent an orgiastic dance. The women's hair flows down upon their shoulders like that of the Minoan women; the bosom is uncovered and the breasts much developed. The triangular shape of the heads indicates a hood or a kind of mitre. Two of them wear a bracelet on the upper arm near the elbow, and all have a very slender waist, with the body shaped like an hour-glass. After my account of the Minoan women there can be no doubt of the close connection between this fresco and the paintings of Knossos. Women taller than the men often appear on the incised stones or galopetre; the bracelets above the elbow, the pinched-in waist, the nude torso, the short skirts are all characteristic of the Cretan women in the Minoan period, and just as in the female figures from Haghia Triada there is in these figures also a certain grace which recalls the women of the present day.

[1] *L'Anthropologie*, xx. 1909, pp. 1–21.

The Abbé Breuil and Don Juan Cabré Aguila have pointed out this resemblance to the Cretan frescoes, but do not admit a very close connection between the two sets of paintings—those of the palæolithic age in Spain and the Minoan paintings of Crete. The most important point among the details seems to me to be the two appendages below the knees of the male figure. There is no doubt that boots are here indicated, though the man is unclothed. A ritual dance of priestesses with some one man is often figured on Minoan seals, and here we possibly have a representation of a similar scene, which is also sometimes found on Mycenæan rings. The presence of an animal, which appears to be a doe, suggests a sacrifice.

The boots are, to my mind, a decisive indication of the origin of this painting. Only the Minoans, so far as we know, wore these boots, which are, as it were, a seal which impresses a date on the rock of Cogul. Moreover, this indication is not the only one, for in Spain we find the same idols and the same votive figures as in Crete.[1]

M. L. Siret recently found in the neolithic soil at Almeria[2] an alabaster statuette which in the distinctly indicated triangle marking the region of the genital organs bears an evident resemblance to the neolithic Egyptian statuettes and the idol of Haghia Triada.

The prehistoric links between the extreme basins of the Mediterranean are being rapidly discovered, and the scene painted on the rock of Cogul is probably connected with the maritime expeditions of the Minoans.

The fact that nine women are found here with only one man connects this painting with the feminine type of the Minoan and Mycenæan religion, in which men had only a secondary part, and religious functions were entrusted to the priestesses. The cult[3] of the sacred axe, too, was diffused in Spain of the neolithic age, and later on we find the Horns of Consecration as in Crete, and

[1] Siret, "Les Cassitérides et l'Empire Colonial des Phéniciens," *L'Anthropologie*, xx. 1909, p. 146.

[2] *Op. cit.*, p. 166.

[3] L. Siret, *op. cit.*, p. 147, Fig. 11.

everything leads us to suppose that the Minoans passed through Spain at the close of the stone age.

Here, then, we have fresh evidence that economic facts are the basis of historical events. The valley of the Ebro, where this painting was found, is the shortest land route from the Mediterranean to England.

According to Strabo, the Greeks followed this route in historic times when they passed into Spain to occupy the richer metalliferous region, and the Minoans probably followed the same valley on their way to the Cassiterides Islands in search of tin. The importance of this valley in prehistoric days is shown by the fact that the river Ebro gave its name to the Iberian Peninsula.

CHAPTER XII

DRESS OF WOMEN IN THE NEOLITHIC AGE

I. THE MOST ANCIENT FASHION NOW KNOWN

IN the dawn of civilisation so bright a light shines from the woman—shines so brightly in the light of religion that the masculine figure remains unnoticed in the shade. Two chapters in my preceding volume on the excavations in Crete treat of feminine costume and woman in religion,[1] and I return to the subject with fresh evidence to show, by a model figure which we may call Cretan till an earlier is found, that female idols were dressed in the same fashion during the neolithic age all over Europe.

From the pile dwellings beyond the Alps, in Sicily and the Balkan Peninsula, from Greece to Troy, from France to Spain, female figures, decorated in the same manner, represent the first traces of female costume in the stone age.

Galloon and lace are much more ancient than has been thought, and were perhaps one of the earliest inventions of women. I would defer to the more competent judgment of my feminine readers, but this statuette (Fig. 105) wears, if I am not mistaken, a dress of the neolithic period. It was found by Dr. Evans at Knossos, and I have to thank him for allowing me to publish it. The head is broken, but round the neck and on the arms we see a series of dots which follow the edge of the neck and sleeves.

[1] *The Palaces of Crete*, pp. 132, 267.

At the back (Fig. 105, B) there is a deeply incised line from the left shoulder to the right hip, and along each side of this line is a row of small punctures. This design is not continued in the front, so it cannot have indicated a sash worn over one shoulder. Upon the stump of the shoulders is a triple series of punctures.

The position of the arms, with the hands upon the breasts, gives this figure a significance which decides a much-discussed question. Archæologists had considered this a characteristic

A B

FIG. 105.—NEOLITHIC IDOL FROM KNOSSOS

A, Front. B, Back.

attitude of the Phœnician Venus (so-called Astarte), found in the Mediterranean countries, and they asserted that the primitive type of this statute came from Chaldæa.[1] We now know that even in the neolithic age this position of the hands, resting on the breasts, is found in images of the divinity, and the similar statues of which large numbers came to light in the excavations of Cyprus are of a later period.

The statuette of lead found by Dr. Schliemann[2] in the second

[1] The terracottas of Chaldæa, which represent a woman with her hands on the breast, have been studied by Fleuzey (*Les origines orientales*, Paris, 1892), and others.

[2] *Troy*, p. 407.

city at Hissarlik has also the arms posed on the breast. On account of the position of the arms upon the breast, and of the *swastika* marked upon the organs of generation, it was supposed to have come from the East, possibly from Chaldæa.

This figure was discredited because Dr. Schliemann and the artist who made the drawing of the *swastika* made a mistake, and when they took the figure to Berlin after washing it the *swastika* had disappeared because it was not incised in the lead.[1] The folded arms still remained as a sign of its remote antiquity, and now we see in Crete a far more ancient statuette which had the characteristic attitude of the Phœnician Astarte.

The linen in which the neolithic bodies in Egypt are wrapped is so fine as to allow us to believe that semi-transparent robes may have been made at that period, as was the case under the early dynasties. The neolithic linen of Egypt is like canvas, so far apart are the threads of the web, and it was woven in so thin a texture that with the embroideries it might have a similar effect to this figure. The fact that the navel is indicated might give rise to some doubt if we had not seen that even in the classical age of Greece these anatomical details were indicated beneath the garment. The frieze passed round the trunk over the beginnings of the hips and across the posterior part of the body, and for that reason I am inclined to consider the lines and dots as indications of a dress, for it is not the custom to tattoo long lines upon the body. In a lake village at the foot of the Alps, on the northern side, there was found (at Laibach[2]) a female figure, also of the neolithic age, whose rich decoration, like this, gives the impression that it really represents a dress.[3]

For the fashions of the neolithic age we can get much information from the female figures of Butmir,[4] with their skirts

[1] *Troja und Ilion*, vol. i.

[2] Hoernes, *op. cit.*, p. 237.

[3] Samples of the woven materials found in the palafitte of Robenhausen and elsewhere are to be found in the museums. Hejerli has treated of this subject in the *History of Primitive Switzerland* (*Urgeschichte der Schweiz*).

[4] *Die neolithische Station von Butmir*, 1895, Plate II. Fig. 2, Plate VII. Figs. 1, 3, 5.

decorated with linear designs or dots incised in the clay. The neolithic design of bands filled with dots alternating with plain bands, as found on the vases from Knossos, is seen reproduced on these idols from Butmir and upon the pottery, where it forms triangles and geometrical figures.

The sacred statues and the priestesses found at Knossos make such a display of nudity at the time when Minoan civilisation had reached its apogee, that we must suppose that to uncover the body more than decency would permit was in accordance with the rites of Minoan religion. The sculptures of the most ancient temples of India are the triumph of complete nudity.[1] Here we find the origin of that admiration of the nude which found its highest development in the art of Greece.

2. THE GIRDLE AND ORNAMENTAL SCARS

The female idol represented in Fig. 90, found in the Caverna delle Arene Candide in Liguria by Don Morelli, wears a cord tied tightly round the waist, and this forms its only ornament, just as in the female figure from Phæstos. At Gorna, near Cracow, a figure without head or arms, and with a similar deep incision round the waist, was found by Dr. Ossowsky[2] and reproduced by Dr. Hoernes in his book. This terracotta statue, with the breasts well developed and the posterior part very prominent after the steatopygous type, excited great surprise, for it seemed as if copied from the neolithic Cretan idol (Fig. 32).

I have already mentioned the female statuette of ivory with a girdle found by Dr. Piette[3] in neolithic soil in France. Such coincidences cannot be passed over in silence as chance occurrences. The simplicity of dress, reduced to a girdle in the neolithic idols in so many parts of the old world, cannot be an autochthonous invention.

[1] Lubbock, *Prehistoric Times*, p. 403.

[2] Hoernes, *op. cit.*, p. 215.

[3] Piette, "La Station de Brassempouy" (*Anthrop.*, 1895, p. 142, and 1897, p. 165).

In the recent publication of Professor Tsountas[1] are some female figures discovered in Thessaly. They are marked on the breast and shoulders with small incisions, which probably indicate scars. One idol has two horizontal marks on the body in the same place as the idol of Phæstos (Fig. 32). I cannot say whether this is a tattoo mark, a painted design, or a scar. The same difficulty is felt in the case of my idol from Phæstos, which does not really bear the mark of a cross but of two v's with their vertex put together. I am inclined to think that it is a scar like those which savages in many parts of the world cut on their skin simply as an ornament. However this may be, the fashion of wearing a decoration so low down upon the body seems to us hardly decent.

The steatopygous women discovered by Dr. Petrie[2] in Upper Egypt were coloured red with four lines on each cheek. The custom of having three or four horizontal cuts upon the cheeks has been preserved by the people of the Soudan, and is also found in South America, especially among women. The female statuettes from the neolithic excavations of Portugal and France[3] also bear four horizontal incisions on each cheek. We need not be surprised at the existence of such a custom in Mycenæan times,[4] for it would be wonderful if it had not existed, for all the customs that now exist in Africa must be supposed to have existed on the Continent of Europe in prehistoric ages. The facility with which some customs are transmitted through innumerable generations is often seen; for example, the drums which are now used in Central and Southern Africa are exactly represented on the monuments of the first dynasties in Egypt. Also on entering the house of a peasant in Crete I was astonished to see the same lamps which were used in the Minoan age, while in the kitchen stood the big jars of terracotta exactly like those of the pre-Mycenaean excavations.

[1] Tsountas, *Dimini e Sesklos*, 1908, Plate XXXIII.
[2] F. Petrie, *Naqada and Ballas*, p. 14.
[3] Déchelette, *Manuel d'Archéologie préhistorique*, pp. 588, 597.
[4] Schliemann, *Mycenæ*, Plate XVI. Figs. 90, 91, 92.

3. HAIRDRESSING

As is now the case among savages, who attach great importance to the arrangement of the hair, the women of prehistoric times spent part of each day in dressing their hair. In an idol of neolithic date, found in the valley of the Nile (Fig. 144, A), we find the black hair put on in a different clay upon the unbaked

FIG. 106.—NEOLITHIC EGYPTIAN VASE FROM ABYDOS.

clay of which the statuette is made. The women of the neolithic station of Butmir have their head-gear made like real embroidered caps.[1] A somewhat unskilful neolithic artist had fixed in the clay two pieces of coal to make the eyes of a female figure, found by

[1] *Die neolithische Station von Butmir*, Plate II. Fig. 2, Plate III. Fig. 1.

Don Morelli in the Caverna delle Arene Candide, and had traced on the head the parting of the hair.

The nudity of female statues was an artistic convention which was imitated also in the cold countries of the Mediterranean. This is proved by the fact that sometimes the women were clothed, and with garments hardly differing from our own even in a hot country like Egypt.

Fig. 106 is a vase from Abydos,[1] now in the Museum of Gizeh, and has rather complex decoration: two boats with antelopes between have many oars; there are palm leaves at the bows, and in the centre two cabins, above one of which stand a man, a boy, and a woman. These buff vases with red decoration from Upper Egypt belong to the neolithic period. Here we see a woman with a skirt exactly like ours of to-day. She probably had long sleeves, for the men of Fig. 107 (which represents the panorama of a prehistoric vase found at Naqada by Dr. Petrie and Mr.

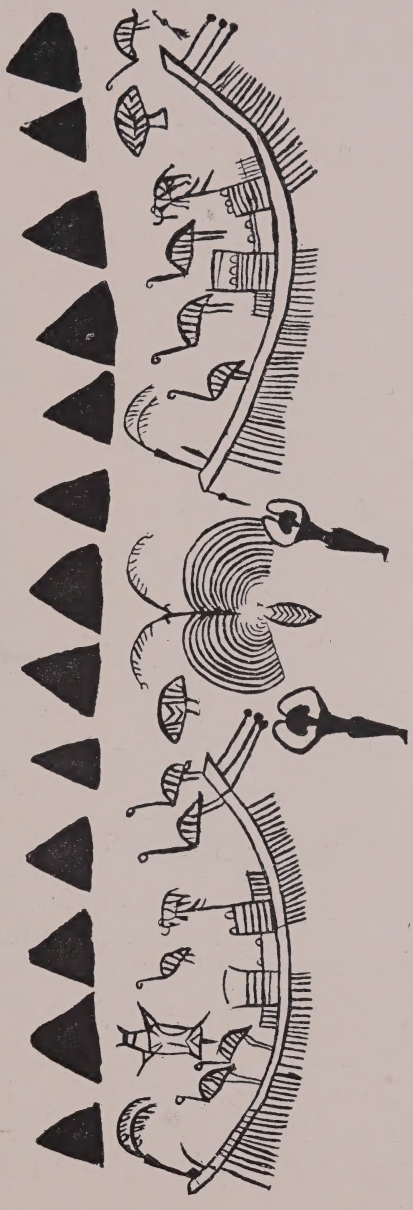


FIG. 107.—PANORAMA OF THE DESIGN ON A NEOLITHIC VASE FROM UPPER EGYPT.

[1] De Morgan, *Recherches sur les Origines de l'Egypte*, 1896, p. 161, Plate X.

Quibell), holding their arms above their heads in the same attitude, have their hands differently made. The reader may decide if this is a salutation.

The two persons with their hands above their heads in Fig. 107 are probably masculine. Their hair exactly agrees with that of two terracotta figures from Libya, found in the palace of

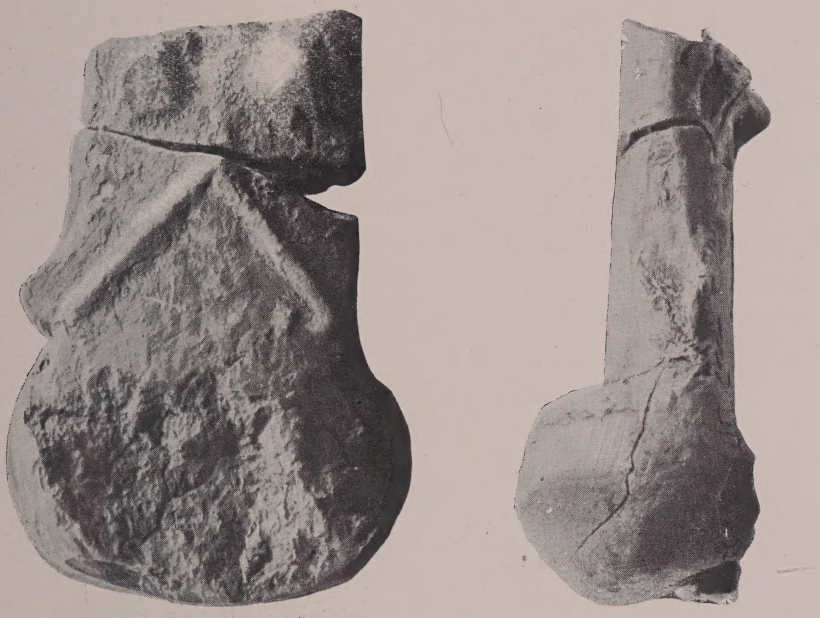
FIG. 108.—TWO LIBYAN TERRACOTTA FIGURES DISCOVERED IN THE PALACE OF HAGHIA TRIADA.

Haghia Triada[1] (Fig. 108). This similarity of hair arrangement shows another point of contact between Crete and prehistoric Egypt; and it is a noteworthy point that in dynastic times there is an end of the resemblance in the adornment of the head between the Egyptians and the Minoans.

[1] *Monumenti Antichi*, xiii. p. 74.

4. FEMININE ATTIRE FOR RELIGIOUS FUNCTIONS

Fig. 109, A, B, is a female idol found in Upper Italy,[1] seen full face, A, and in profile, B. The head and arms are wanting; the breasts are well formed. From the thorax two projecting lines pass down across the abdomen, indicating a band, which was a religious symbol distinctive of the priestesses in sacred



A B

FIG. 109.—FEMALE IDOL, DISCOVERED ON THE HUT FOUNDATION AT VHO, NEAR CREMONA.

functions. Upon the right side there is a small projection, the significance of which I do not know. The thighs have probably been broken off that it might stand upright. This idol is flattened, like others from the Aegean; this can be seen in the side view, Fig. 109, B, where the excessive prominence of the posterior part is apparent, putting this statuette in the category

[1] Now in the Prehistoric Museum in Rome. I have to thank Professor Pigorini for permission to publish this illustration. The figure came from the hut foundations at Vho, province of Cremona. It is of reddish earth, well baked, 80 millimetres in height, 38 millimetres in breath, 15 millimetres thick.

of steatopygous women. Professor Carucci [1] describes a figure from the Cave of Pertosa, near Salerno, which has much resemblance with this. It is a bust of earthenware, with the head and arms absent; it is broken off at the waist. Two cords pass down from the shoulders, cross on the breast, and pass each to the opposite side.

In the tombs of Knossos Dr. Evans [2] found a steatite pendant rather more than 2 centimetres in length, with a lateral aperture for suspension; he believes it to represent the Great Mother. This little idol, without arms, has on the breast two bands, which cross and pass from the shoulders down the sides; at the back there is nothing. The dress reaches half-way down the thigh; there are two horizontal borders, interrupted in front by the folds of the mantle. Other amulets similar to this are found in Crete and Libya. This style of dress is common in the neolithic idols of Servia,[3] where eighty-three terracotta figures were found, all of women, one in each hut.

Similar bands were applied to the vases used in religious functions. A vase found by Dr. Schliemann at Hissarlik, for instance, should, I think, be interpreted in this way. It is a two-handled vase representing a female figure. A series of small circles forms a necklace round the throat, and a band passes across the body of the vase from the left shoulder just as in the neolithic figure shown at the beginning of this chapter. The fact that the vase is of clay, not well baked, is another indication that it was intended for religious uses.[4]

5. THE PAINTED SARCOPHAGUS OF HAGHIA TRIADA

The painted sarcophagus of Haghia Triada, recently illustrated by Dr. Paribene,[5] will explain better some details of

[1] Carucci, *La grotta preistorica di Pertosa*, 1907, Plate XXXV.

[2] Evans, *The Prehistoric Tombs of Knossos*, p. 85.

[3] Salomon Reinach, "La Station Neolithique de Fablanica (Servie)," *L'Anthropologie*, 1901, p. 528.

[4] Schliemann, *Troy*, p. 394, Fig. 189. In the fifth city of Troy, other vases of female form have two deeply incised lines passing from the shoulders and crossing beneath the breast.

[5] *Monumenti Antichi*, vol. xix. 1908.

Minoan religion, and the fashion of dress of the priestesses. In Fig. 110 (Frontispiece) a priestess is pouring a pail of red liquid into a kratera, which is placed between two sacred axes fixed upon pyramidal bases. Both the double axes and the bases on which the conical supports, covered with leaves, are fixed, are nearly identical with several examples at Haghia Triada. I have published a specimen of a form used for casting these sacred images of the quadruple axe in bronze.[1]

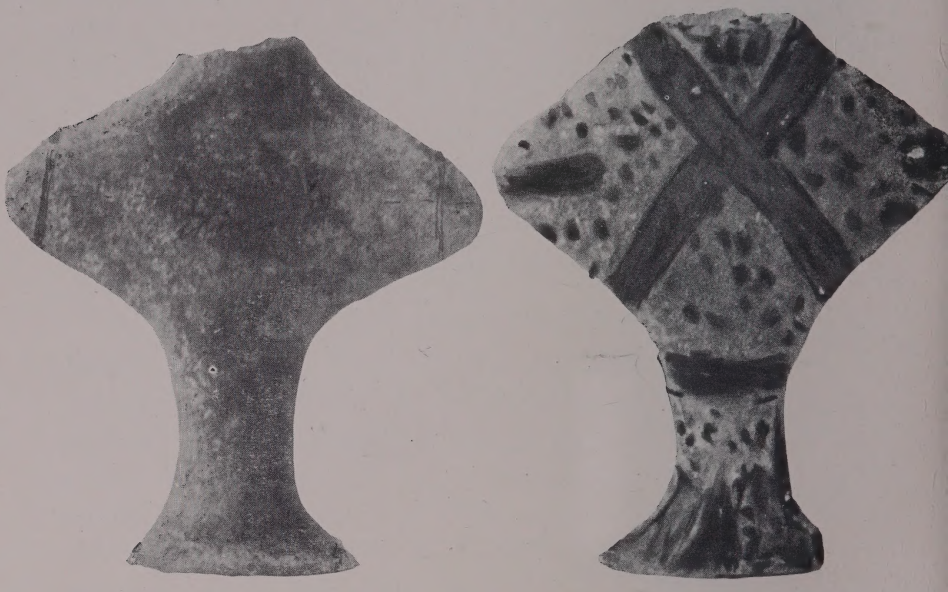
The woman who is pouring out the liquid has a sort of white skirt made from the skin of an animal, as have also the men who bear offerings. The torso is not bare but covered by a bodice with sleeves which end above the elbow. Broad blue bands pass round the neck and down the sleeve ; the girdle, too, is formed by a strip of blue, and a band of the same colour probably crosses on the breast, for another priestess, turned to the right, has the same kind of sash. The next figure, a woman with two pails hung from her shoulders, wears a long blue dress with the lower edge adorned by flounces. The neck and sleeves are edged by a band of three colours, and this woman also has a red sash edged with two black lines passing obliquely across the chest.

The female figures which I illustrated in the preceding volume vary so much from these both in richness of texture and the number of flounces that we might conclude that this scene represents a funeral, and the women for mourning are wearing simpler dresses and less cut open at the neck. According to Dr. Paribene's calculation, this sarcophagus dates from about 1500 B.C. We know that from the time of the first dynasties in Egypt the priests wore panther's skins[2] at the religious functions, and here, too, the priestesses also wear a skin tight to the waist, with an appendage like a tail. Similar costumes were known already by the figures on several Minoan seals, but the large scale of this painting allows us to become better acquainted with the

[1] *The Palaces of Crete*, p. 198.

[2] A. Ermann, *Egyptian Religion*, p. 88.

details.[1] The three priestesses on the sarcophagus of Haghia Triada are fulfilling their most important functions of bringing sacrifice and offerings ; the men have only a secondary part as musicians or bearers of the victims and of a boat. Two other women appear on the sides of the sarcophagus upon a chariot drawn by griffins, who accompany the dead on his journey beyond the tomb. We may assert here without hesitation that at this epoch (1500 B.C.)



A B

FIG. 111.—IDOLS IN THE MUSEUM OF PALERMO.

Minoan religion still preserved its matriarchal character. The supremacy of women in religion was maintained till the time of Mycenæ ; this psychological direction impresses a fundamental difference on the spirit of Mediterranean civilisation. There is great originality in the Minoan creed, which differentiates the

[1] Dr. Schliemann discovered a similar figure with a furry skin (*Troy*, p. 409, Fig. 235). The breast is decorated with two incised lines which cross, and at the point of intersection is a circle as ornament. Two similar lines are seen on Fig. 200, p. 399.

primitive religion of the Aegean from the religion which developed in the Valley of the Nile in dynastic times.

The Museum of Palermo possesses two idols of dark clay, 10 centimetres in height, which I reproduce in Fig. 111, A, B. In A only some traces of red colouring are seen ; in the other, B, Dr. E. Salinas had the kindness to touch up the photograph with colour and ink in order to throw up the design of the decoration, which is made alike on both front and back. Here also we find the characteristic crossed sash which we discussed in a preceding paragraph.

Upon the stump of the shoulder, round the waist and upon the part of the base corresponding to the petticoat, appears the same red sash. Dr. E. Salinas writes that these idols with two others were found in a tomb opposite the gate of the R. Favorita in the Piazza Leon at Palermo. On Fig. 111, A, were marked with ink four holes which perforate the stump of the shoulder and the base, through which a thread was probably passed, to be used for hanging up these idols. Their flattened form is identical with that of the similar figures coming from the Aegean. The surface is spotted with black to give the characteristic tiger-like appearance, which we found in the costume of the priestesses on the painted sarcophagus of Haghia Triada. This coincidence helps us to explain the relation of the Minoan cult with Sicily.

The conservative spirit of religion, of which I have repeatedly spoken, appears in the close resemblance of the Mycenæan idols with those, also of the neolithic age, discovered in Thessaly by Professor Tsountas,[1] and for the pre-Mycenæan period those which came from the excavations in Melos.[2]

[1] Tsountas, *Dimini e Sesklos*, Plate XXXVI. Athens, 1908.

[2] *Excavations at Phylakopi in Melos*, Plate XXXIX. Fig. 36.

CHAPTER XIII

THE NECKLACE

I. NUDITY AND NECKLACES

IN Africa, in South America, and in Australia there are at the present day many peoples living in a state of complete nudity. Men in the centre of Africa wear a piece of skin, but instead of putting it in front like the fig-leaf they turn it to the back. Women when they come naked out of their huts to attend to their business put a necklace round their necks and a bracelet or two on their arms and ankles and are in full dress. In Baccari's recent book on the Congo there is a photograph of a Bangala chief with his women,[1] who for full dress are wearing a girdle (a simple ribbon tied round the waist where it is smallest), a conspicuous necklace, and a few bracelets. The idea of clothing is non-existent, women are not ashamed of being completely nude ; and it may be asserted that it is instinctive to put on a necklace before anything else and not to care at all about nudity.

In attempting a study of the fashion of dress in the neolithic period we are in the condition of a person who wants to describe the mode in which a person was dressed when upon the funeral pile, for weather, air, and damp have the same effect as fire, and destroy all that is not of stone, pottery, or metal. Feathers, pieces of fur, woven stuffs and all wooden objects have disappeared. For this reason necklaces which have been preserved

[1] E. Baccari, *Il Congo*, pp. 147, 155.

are very useful, for by their study we find confirmation of the fact that fashion was the same all over the Mediterranean basin and on the Continent of Europe.

Fig. 112 represents some terracotta beads which I found at Phæstos at the bottom of a pit in the neolithic strata, very near the virgin soil. Figures A, B are of dark yellow earthenware; C, D, also of smooth terracotta, are rather different in shape.[1]

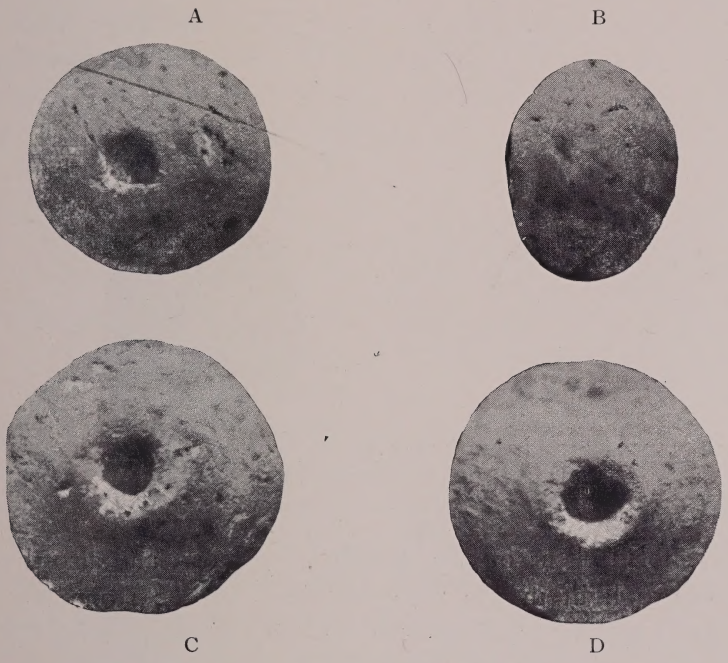


FIG. 112.—TERRACOTTA BEADS FROM THE NEOLITHIC STRATA OF PHÆSTOS.

Fig. 113 represents other beads of the same kind which I found in the neolithic soil at Coppa Nevigata near Manfredonia. Italian museums are full of these terracotta beads, which are perforated so that they can be strung and worn round the neck in one or two rows as ornaments. In Spain and all over the Continent these necklaces are very common. Drs. Flinders Petrie

[1] The illustrations are one-fifth less than the actual size.

and Quibell [1] found at Naqada in Egypt some drawings of figures of the neolithic age wearing necklaces of a single row of beads, and the ivory and bone statuettes were ornamented with from two to four rows. It seems that even men wore necklaces, for several of these statuettes had the chin pointed in the form of a beard.

It is the fashion nowadays when one finds a round piece of anything with a hole in it to say that it is a spindle whorl, and one sees beads from necklaces wrongly ticketed as spindle whorls on the shelves of museums everywhere. Dr. Schliemann, who was the author of much of this confusion,[2] did, however, point out that the spindle whorls of

FIG. 113.—TERRACOTTA BEADS FROM THE NEOLITHIC SOIL OF COPPA NEVIGATA, NEAR MANFREDONIA.

Troy resembled those of the terremare of Italy, and also those which came to light in the lake dwellings of the stone age in Switzerland ; those from Maringen, on Lake Bienne, for example, were of the same form and design as the spindle whorls of Hissarlik.

2. DR. SCHLIEMANN'S VOTIVE SPINDLE WHORLS

In the excavations of Troy Dr. Schliemann found 22,000 spindle whorls. They are objects in the shape of a broken-off cone, of a disk, of a lens, or a hemisphere, and all are pierced by a hole. This great number excited so much surprise that the

[1] *Naqada and Ballas*, Plate LIX.
[2] Schliemann, *Troy*, Figs. 1817–22.

question was asked what could be the reason of this astonishing mass of spindle whorls, and it was supposed that they were *ex votos* brought to the protecting goddess of the city of Troy, Athene Ergana.[1] But Dr. Schliemann excavated three hundred just the same in the ruins of Mycenæ, which excited the suspicion that they were not spindle whorls brought to the tutelary goddess of Troy. They are shaped like a broken-off cone, like that represented on Fig. 114, A, B, and are made of quartz, schist, steatite or terracotta ; their colour varying from yellow to red, from drab to black. In the last part of his book on Troy Dr. Schliemann gave over a hundred illustrations of these so-called spindle whorls.

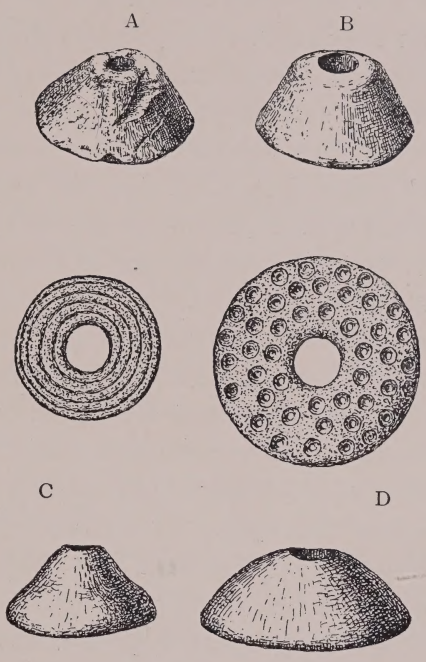


FIG. 114.—A, B, BEADS OF A MINOAN NECKLACE FOUND IN CRETE. C, D, BONE BEADS OF A NECKLACE FOUND IN THE TERREMARE.

My reasons for suggesting another interpretation are as follows. While excavating at Calivia, near Voris in Crete, I discovered in a larnax a skeleton with two broken cones lying near the neck (Fig. 114, A, B, one-quarter less than the actual size). Figure A is of drab steatite with white marks, and figure B of brown calcareous stone ; beside them were other beads of worked quartz in the form of a lens, and some like a little cask of cornelian, and one of amethyst.

As all these cone-shaped beads were perforated, and were found in place near the neck, there can be no doubt that they formed a necklace. The tomb which I excavated belonged to

[1] Schliemann, *Ilios*, p. 260.

the Mycenæan period, but the same kind of beads were found in more ancient tombs in the island of Crete, and it may be said that they were common. Professor Halbherr, too, found several stone beads which formed part of necklaces like these,[1] and many more were found by Dr. Evans.[2]

In company with Dr. Hazzidaki I examined the collection in the Museum of Candia, and we found that the so-called spindle whorls could not be used in spinning, because in many of them the hole is eccentric, and the oblique aperture would not have served to make the spindle spin properly ; others are too light, or have so small a hole that a thread might be passed through to make a necklace, but not the point of a spindle. In some disks of terracotta long use had produced erosion on one side, and in these cases it was certainly a string which had worn away the clay.

Beads in the shape of a truncated cone have been found in Italy ; some made of stone or terracotta were found in the lake dwellings of Fimon by Dr. Lioy,[3] who considered them to be amulets. Some were found in the terremare along the valley of the Po, and Professor Helbig[4] is of opinion that they were worn round the neck. In my recent account of the settlement at Coppa Nevigata, near Manfredonia,[5] I published a collection of great and small beads exactly like those from Troy.

Round objects of bone similar in shape to those of terracotta are common in the terremare ; I show some which are in the Museum at Modena (Fig. 114). The greater, D, is 40 millimetres in diameter. They are not heavy enough to be used as spindle whorls, and probably, like the small bead, C, which is 23 millimetres in diameter, formed part of a necklace. Figure D is decorated

[1] *Cretan Expedition*, xi. "Report on the Researches at Erganos, Panaghia, and Courtes," *Journal of the Archæol. Inst. of America*, vol. v. 1901.

[2] A. Evans, *The Prehistoric Tombs of Knossos*, I. and II. (from *Archæologia*, vol. lix. Fig. 101).

[3] Lioy, "Sulle abitazioni lacustri del Fimon," *Atti del Istituto Veneto*, 1884, vol. x. p. 342.

[4] W. Helbig, *Die Italiker in der Poebene*, Leipzig, 1873, pp. 21, 22, 83.

[5] *Monumenti Antichi*, Accademia Lincei, 1909.

with small concentric circles. Figure C has a decoration similar to that of the little rounds found by Quagliati and Ridola in the archaic necropolis near Timmari in the Materano.[1] The conical forms which Schliemann took for spindle whorls were imitated in gold as beads for necklaces, and he himself found stamps of granite at Mycenæ.[2] Dr. Evans also found them in two tombs at Knossos in sufficient numbers for him to be able to remake the necklace.[3] At Phæstos, Mycenæ, and Argos the same conical shapes were found, but of gold. It may therefore be asserted that the cone-shaped bead was in fashion in Minoan and Mycenæan times for necklaces of gold, steatite, terracotta or stone.

As for the disk or hemispherical shapes, which were also numerous in the excavations of Crete, we may consider them as common types. They were found in the neolithic period in Egypt, and have been described by M. de Morgan.[4] At Butmir,[5] also, of the neolithic period, terracotta disks of the same size and shape were found. We may, therefore, decide that, as a general rule, these round objects from excavations of the neolithic period may be considered as beads from necklaces. In my excavations in the neolithic soil at Phæstos I found several of these beads made of bucchero with geometric designs upon the periphery.

The fact that spindle whorls are rare in the first city of Troy, while they are extraordinarily abundant in the second city, and disappear in New Ilion, does not agree with the hypothesis that

[1] Dr. Paolo Carrucci found beads like those from Hissarlik, and Plate XXXII. from his book describing the prehistoric Cave of Pertosa exactly resembled the lithographed plates at the end of the volume *Ilios*. Dr. Carrucci also interpreted the terracotta beads as spindle whorls, though, like those of Fig. 11 of Plate XXXIII., they are too small to be fixed on the tip of the spindle. The cone-shaped beads were described as heads of hair-pins.

[2] Schliemann *Mycenæ*, p. 121.

[3] A. Evans, *The Prehistoric Tombs of Knossos*, pp. 76, 130.

[4] M. de Morgan, *Recherches sur les Origines de l'Egypte* : "L'Age de la pierre et des metaux," 1896, p. 145, Fig. 328.

[5] *Die neolithische Station von Butmir*, Wien, 1898, Plate V.

they are votive objects, for we know with what difficulty religious ideas change, while fashion is a far more unstable thing. Their form, too, is far too varied for cultus objects, for in nothing is there more uniformity and more rigid conservatism than in matters of religion. Their size, form, and decoration differ so much that we can scarcely say which is the predominant type. This variety is quite opposed to the theory of a votive object, while it is quite explicable in an object of ornament.

The custom of wearing two or three rows of a necklace round the throat, as seen on the idols from Hissarlik,[1] and in the gold rings of Mycenæ, and also in many incised stones used as seals, may explain the great number of beads found by Dr. Schliemann in the excavations of Hissarlik. If these were not really beads from necklaces it would be still more difficult to explain the absence of these. Troy was a rich city and gold was so plentiful there that Homer called it πολύχρυσος. Dr. Schliemann discovered there ten treasuries, and gold necklaces were plentiful; the inhabitants were a people inclined to luxury, and those who could not hang precious objects round their necks must, in order to be in the fashion, have worn necklaces of seeds and beads of less costly material. Thus we can explain the great abundance of these objects. If there were no necklaces we should have to seek for them, and there are no necklaces for the poor in Dr. Schliemann's account of the strata of Hissarlik.

I do not hesitate to consider as beads from necklaces all the small spindle whorls described by Dr. Schliemann, including the round stones with a hole in the centre, found at Hissarlik, of which he says that he does not know the use.[2] Though they may be rather large this does not matter, for we know how heavy were the copper bracelets which Dr. Schliemann discovered in the first city of Troy.[3] Neither primitive peoples nor modern savages mind weight in their necklaces and bracelets,

[1] Schliemann, *Ilios*, Figs. 203, 204, p. 377; Fig. 1413, p. 672.
[2] Ibid., Fig. 285, p. 281.
[3] Ibid., Fig. 116, p. 284.

and skeletons have been found in Egypt with very large disks of terracotta upon their necks.

As for the spherical beads described by Dr. Schliemann as spindle whorls, some have been found made of gold, and have been strung together to make necklaces; large spherical or hemispherical beads, or beads formed of two cones put together, were found made of crystal in the prehistoric tombs of Knossos by Dr. Evans. They were pierced, and certainly belonged to necklaces.

The richness and variety of the designs used for their decoration more than every other reason oblige us to think that they must be objects for ornament, and must have been used in Troy as necklaces, not as spindle whorls. The designs include representations of human faces, plants, and animals, besides geometric patterns. They are worked with great care and distinctness, and many of the rounds and truncated cones are decorated like the pottery with deeply incised designs, filled with white substance.

3. NECKLACES MADE OF THE VERTEBRÆ OF FISHES [1]

In the island of Virginia, Lake Varese, there are on the upper storey of the Museum two tubes which contain fifty vertebræ of the pike found in the excavations of the palafitte. On the ground floor is another glass tube containing thirteen vertebræ of the same fish from the neighbouring palafitta of Bodio. Some of these vertebræ are represented on Fig. 115.

When I saw these vertebræ I remembered that there are some just the same in the Museum of Candia; and that Dr. Halbherr had drawn twenty-four which he had found at Phæstos,[2] also that Dr. Schliemann had found similar ones at Troy.[3] I therefore decided to make a study of them, and wrote to ask Dr. Hazzidaki to send me a photograph of the fish vertebræ

[1] A. Mosso, *Atti R. Accademia delle Scienze di Torino*, 1907, vol. xlii.

[2] *Monumenti Antichi*, vol. xii. p. 23.

[3] Schliemann, *Ilios*, Leipzig, p. 481, Figs. 591, 598.

possessed by his museum, and to lend me one or two specimens of them.[1]

The fact that similar vertebræ of a pike are found in Crete, among the ruins of the second city of Troy, and in the palafitte of Isola Virginia and Bodio gives to these bones a fresh significance. Professor Fr. Bassani believes that two vertebræ found at Gournià, in Crete, belong probably to the genus *Carcharias*, one of the most voracious of the sharks which attack man. That these long vertebræ, as well as the flat ones of the pike, were used for necklaces in prehistoric times is proved in the brothers Siret's book on Spain.[2] On Plates 50, 52, 53, and 54 are representations of several necklaces in which the vertebræ of

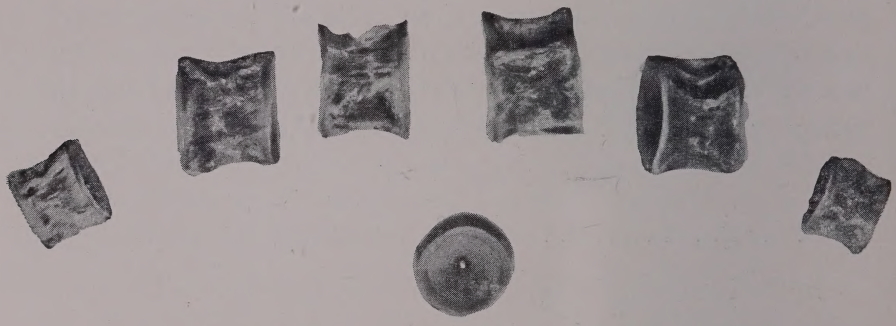


FIG. 115.—NECKLACE MADE OF THE VERTEBRÆ OF A PIKE.

the pike are alternated with the conical shells of the *Dentalium*. In another of these necklaces, Plate 50, twenty-six vertebræ and nine *Dentalium* shells may be counted ; another contains eleven.

In the terremare of Castione one of these vertebræ was found perforated through its axis together with shells which formed a necklace ; [3] several more were found in the terremare with shells

[1] I referred to Professor Fr. Bassani of the University of Naples, as one of the most competent naturalists for the skeleton of fish, and understand from him that some of these vertebræ belong to the pike, others to the shark.

[2] H. et L. Siret, *Les premiers âges du métal dans le sud-est de l'Espagne*, Anvers, 1887.

[3] Strobel, *Bull. paletn. ital.*, xx. p. 104.

of *Dentalium* ;[1] and this year some more vertebræ of the pike came to light in the excavations which I made at Coppa Nevigata, near Manfredonia, and at the neolithic station on the Pulo near Molfetta. Vertebræ of the pike were also found in the Caverna dei Balzi rossi in Liguria,[2] where they formed a necklace composed of a double row, all perforated. Others came from the excavations in the hut foundations of Remedello.[3] We may therefore conclude that this custom was diffused among the various peoples of the Mediterranean in the neolithic age, and in the earliest prehistoric times.

The vertebræ of the pike are naturally perforated by a very small hole, as may be seen in the lowest example of Fig. 115. This hole is so fine that it had to be enlarged to enable a fine cord to be passed through it in order to make a necklace.

Out of thirteen vertebræ found at Bodio, on Lake Varese, only four had a hole passing through the centre, and this hole is in all very small so that only a thread could be passed through. Also in those from Crete scarcely a third have a hole through, and it is the same also with the eight figures published by Dr. Schliemann and attributed to the second city of Troy.

Those vertebræ which have no hole through were probably worn as simple amulets, and there is a slight furrow in their thickness which could easily hold a string. The spinal cord passes above the body of the vertebræ in which the cavity which serves for the insertion of the ribs may be seen. The diameter of these vertebræ varies from 5 millimetres to 20 millimetres.

The vertebræ of the shark, which are the least beautiful of the vertebræ of fishes, were probably chosen because they belong to the most terrible of the sharks which kill and eat man. The vertebræ of bony fishes are certainly more ornamental ; those of the shark, being cartilaginous, wrinkle in drying. These fishes must have been dangerous enemies to a primitive people who sailed in small boats, and it is easy to understand how the custom arose of wearing one of their vertebræ as an amulet when they

[1] *Bull. paletn. ital.*, xxviii. p. 33. [2] Ibid., xx. p. 121.
[3] Ibid., xxiv.

had succeeded in killing one, and also that necklaces should have been made of them.

That the custom existed of wearing the vertebræ of these fish as an ornament is proved by the fact that imitations of both species of vertebræ have been found. At Haghia Triada[1] some were found made both of gold and of stone, in shape exactly like those of the shark at Gournià (Fig. 116); the first is of stone, the other on the right is of gold. One of marble was found at Haghios Onoufrios and is shown in the centre of the illustration; others were found at Kumasa, two of these being represented on Fig. 116, the first of calcareous stone, the second, on the right, of gold. Hence we have no doubt that these vertebræ were used as ornaments or as amulets.

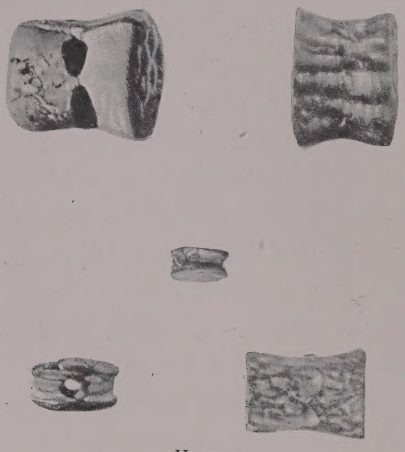


FIG. 116.—IMITATION FISH VERTEBRÆ MADE OF GOLD AND OF STONE FOR MINOAN NECKLACES, FOUND IN CRETE.

As the pike does not exist in any river in Crete, the fashion of adorning oneself with the vertebræ of this fish must have been an imported one; and as I found some of these vertebræ in the neolithic soil on the Pulo, near Molfetta, it may be admitted that this fashion was possibly more ancient in other countries of the Mediterranean than the Minoan palaces of Crete.

Perhaps in the hands of a more skilful seeker the necklaces of fish-bones may give the clue which will unravel the tangled skein of the relations between the different peoples of Europe from the neolithic to the bronze age. In pointing out this new field of study I must emphasise certain facts which stand out among the quotations of places which have necessarily been abbreviated:

[1] Halbherr, *Memorie del R. Istituto Lombardo*, 1904, Plate VI. Figs. 25, 26.

first, the extreme slowness with which the fashion increased and the length of time it lasted; and next, the fact that the great diffusion of the necklaces of vertebræ (from the caves of Liguria to the hut foundations of Upper Italy, to the station of Coppa Nevigata, near the Gargano, to the Pulo, near Molfetta, to Crete and to the first city of Troy) gives evidence of the relations which existed in prehistoric times between the most distant parts of the Mediterranean.

4. BRACELETS AND TORQUES

The same metal necklaces which appeared in Italy and the Continent from the excavations of the bronze age are now worn in Central Africa.[1] In the Aeneid[2] Virgil describes the Trojans as wearing a flexible circle of gold passing round the neck above the breast. This is the *torque*, which appeared in the beginning of the bronze age. One, photographed by Bottego in his last journey in the interior of Africa,[3] is identical with those which abound in prehistoric museums. The arm-bands and ear-rings are also the same.

The very heavy stone bracelets of the neolithic age are now found in Central Africa, and our wonder ceases when we pass before the cases of our museums and think how patiently the men of old bore the enormous weight of these ornaments. Tradition is not extirpated, because it has its roots in human nature, and tendencies are renewed through atavism.

We all wonder at the power of Rome, who gave civil and moral unity to the ancient world. But prehistory now furnishes indisputable proof that in remote ages, at the dawn of civilisation, there was over a superficies that would correspond to the Roman Empire, a community of religion, of customs, and of arts and industry, so that the peoples of Europe, of Asia, and of Africa appear as brothers and members of the same family. The con-

[1] *Bull. paletn. ital.*, iv. 1878, Plate I., and viii. Plate VI.
[2] Aen., v., 558, 559.
[3] *L'omo: Seconda Spedizione Bottego*, 1899, p. 405.

ditions of humanity were different in the two great historical periods. We can understand how diverse peoples could live contemporaneously with the same civilisation under the dominion of the Roman Empire; but in the times before history, when there was no dominant power of one nation over all the others, uniformity would depend on psychical facts, on commercial relations, on the instinctive and recondite impulses of the human mind.

CHAPTER XIV

FIGURES OF ANIMALS FROM THE NEOLITHIC AGE TO THE BRONZE AGE[1]

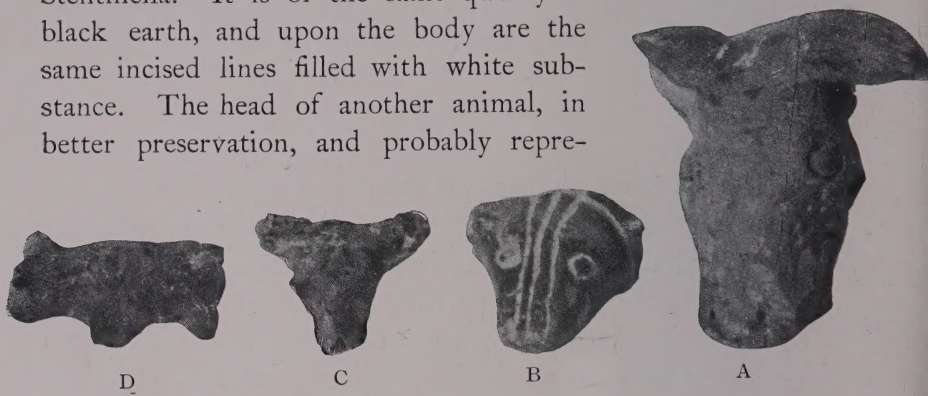
I. ECONOMY AND ART

ART in the beginning was not developed by aesthetic causes but by financial reasons. Poor men who were unable to offer a living victim as a sacrifice employed artists to make them an image which, offered with prayers, might serve to appease the divinity. Thus what happened was the opposite of what might have been expected. It would have seemed most natural for the first artists to have represented the trophies of the chase, the excitement of killing wild beasts, and the apotheosis of strength and courage. They did not even choose for representation the animals which would produce the most impression—the stag, the chamois, or the lion ; but the artists went to a corner of the stable and copied the domestic animals. This proves the fact that religion was the foundation of art, and the first sculptors applied themselves to the making of the images of heifers, rams, and sows for religious ceremonies rather than to decorative art. And it was the poor who urged art along this road, and later the innumerable bronze statues of small bulls found in Crete of the Mycenæan period represent the cheap victims of the burgher class.

At Knossos Dr. Evans collected twelve terracotta figures of the neolithic period, and I have to thank him for leave to repro-

[1] *Vide* "Idoli femminili e figure di animali dell' età neolitica" (A. Mosso), *R. Accademia delle Scienze di Torino*, 1909, pp. 375, 395, with two plates.

duce four of them which have not before been published. The head of a bull (Fig. 117, A) is modelled in exact proportion; the form of the nostrils and the poll, with the horns and ears rising from it, are the work of an expert modeller in clay. Figure B shows a similar head of well-baked black earth, decorated with deeply incised lines filled in afterwards with white substance. In the Museum at Syracuse is the body of an animal which came to light in the neolithic excavations made by Professor Paolo Orsi [1] at Stentinella. It is of the same quality of black earth, and upon the body are the same incised lines filled with white substance. The head of another animal, in better preservation, and probably repre-



D C B A

FIG. 117.—NEOLITHIC TERRACOTTA ANIMALS FOUND AT KNOSSOS. RATHER LESS THAN THE ACTUAL SIZE.

senting a bull, is one of the most ancient examples of the plastic art in Italy.

According to Professor Orsi's description, "it is the head of an animal with pointed horns, long narrow muzzle of about the same length as the neck; if it were not for the horns it might be taken for a wolf. The horns are smooth, and so is the eyeball, which is level and surrounded by a furrow. All the rest of the surface is dotted all over in every direction by the stecca with little dashes, indicating a rough, hairy hide. In the whole we see a primitive but not unsuccessful attempt at copying from nature. We conclude that it must have been either a toy or an amulet, judging from the hole for suspension which is bored through the skull at the height of the ears or horns, whichever they are."

[1] "Stazione neolithica di Stentinello," *Bull. paletn. ital.*, 1890, xvi.

Fig. 117, C, is another bull's head, and D represents a whole bull with the legs broken off. Similar figures are found in various parts of the island of Crete. Among others, I recall one of black earthenware [1] discovered at Psychro by Dr. Hogarth, and I publish one of black earthenware with the fore-legs missing, which was given me by Dr. Hazzidaki (Fig. 118). The bulls from the neolithic station of Butmir [2] have some affinity with those of Crete and of Stentinello in Sicily, and though they possibly belong

FIG. 118.—BLACK TERRACOTTA OX OF THE NEOLITHIC PERIOD, DISCOVERED IN CRETE.

to a later period, they keep the same type of decoration as applied to animals, except that instead of straight lines spirals have been used.[3]

[1] *Annual of the British School at Athens*, vi.

[2] The study of the figures of animals in prehistoric times has been fully treated by Dr. Hartmann (*Zeitschrift für Ethnologie*, 1877, p. 457), by Dr. Hoernes (*Urgeschichte der Bildenden Kunst*, p. 145), and others.

[3] The bull of Butmir (Plate V. Fig. 1) has a fish-bone on his nose ; some triangles are traced upon his forehead, and on the back there is an incised design of spirals (*Die neolithische Station von Butmir*, 1898, p. 28).

These indications are sufficient to point out the relation of the Aegean with Italy, and show how far the artistic sense was developed before the discovery of metals. The very material of which the figures of animals were modelled proves their connection with religious ceremonies. At Heliopolis, in the midst of well-fired pottery, Professor Schiaparelli found a bull of unbaked clay, 4 centimetres in length; and the animals of the Ist Dynasty discovered at Abydos are also of unbaked clay; they form a group of four cows, one bull, and several sows. The animal figures[1] discovered by Schliemann in the fourth city of Troy are less ancient than those of Crete and Egypt just alluded to, but they also are of scarcely baked clay; and in the seventh stratum of the hill of Troy[2] there came to light figures of animals identical with those of the terremare, which will be described in the next section.

2. FIGURES OF TERRACOTTA AND CRUDE CLAY DISCOVERED IN THE TERREMARE

Dr. Hoernes has already noted in his "Primitive History of Plastic Art in Europe"[3] that clay figures are found more especially in the Southern and Eastern parts of Europe, and are almost entirely absent in the North, and from that circumstance he deduced the fact that the artistic impulse could not have come from the North. In the palafitte human or animal figures are rare.[4] The work of Keller,[5] the originator of research in the Swiss palafitte, contains no figures of human beings or animals;

[1] Petrie, *Abydos*, ii. Plate VII.

[2] Dörpfeld, *Troja und Ilion*, p. 411.

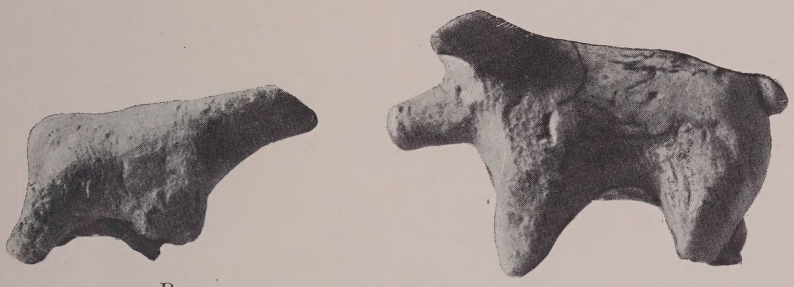
[3] *Op. cit.*, p. 169.

[4] Professor Pigorini (*Monumenti Antichi Lincei*, i., Fig. 5) has collected the bibliography of this subject, and published a figure resembling a sow. Rough terracotta quadrupeds have been found in the terremare of Gorzano, Servirola, S. Polo in Reggiano, Castellazzo in the Parmense (Pigorini, "La terramara di Castellazzo Fontanellato," *Monumenti Antichi*, vol. i. 144, Plate II. 5). Boni, *La terramara di Montale*, Plate ii. V. 16–18.

[5] F. Keller, *Die keltischen Pfalbauten in der Schweizerseen*, Zurich, 1865.

they are not, however, entirely absent, as witness the example published by Gross.[1]

It seems as if the Alps opposed a barrier to the spread of the plastic art. The extension of animal figures from Nubia, across the Mediterranean, as far as Southern Italy and Liguria, is worthy of attention. In the terremare, too, figures of crude clay are found. I note, for example, a head of an animal found in the terremare of Castellaro del Vho, now in the Museum of Milan, similar to that of the neolithic period from Stentinello, reproduced in my "Idoli e figure di animali dell' età neolitica."[2] This animal and a female idol which stands near it are both



B A

FIG. 119.—TERRACOTTA ANIMALS FOUND IN THE TERREMARE. PREHISTORIC MUSEUM, ROME.

of crude clay. The fact that these Egyptian animals of the neolithic period are mostly of earth simply dried in the sun, like the female idols, obliges us to widen our horizon, and to recognise in facts which originated in the dawn of civilisation the first and most fundamental expression of the religious idea. This comparison of the female idols and animals of the neolithic period found in Egypt, and made of crude clay like those of the terremare, is of fundamental importance in the question of Mediterranean civilisation. We are here near the most ancient springs of belief, and even here we see an attempt at giving an archaic

[1] Gross, *Les Protohelvètes*, 1883, Plate XXVI. 65.

[2] *R. Accademia delle scienze di Torino*, 1907, p. 375.

appearance to cultus objects. It is the inheritance of a faith which has transfused its creed, and still in its rites maintains intact the tradition of the past. The crystallisation of ancient things, so characteristic of the Catholic Church, is the effect of a psychological law which constitutes the foundation and essence of religion.

In the Prehistoric Museum of Rome is the figure of a sow, of whitish terracotta (Fig. 119, A),[1] which was found in the terremare of Reggio Emilia. Another animal, which has the outline of a bear, but as to whose exact species I dare give no opinion, is

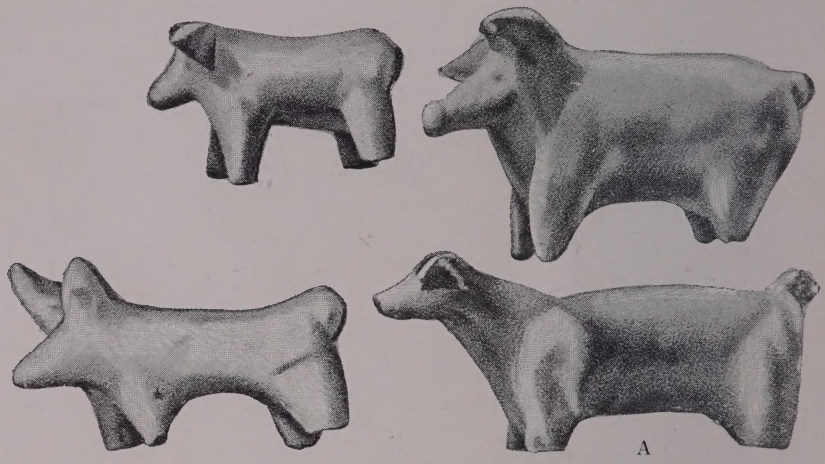


FIG. 120.—ANIMAL FIGURES IN POTTERY. MUSEUM OF REGGIO EMILIA.

illustrated in Fig. 119, B, and came from the terremare of Castellaro, near Brescia. The four figures of animals (Fig. 120) are in the Museum of Reggio Emilia. Dr. Chierici, who collected them in the district of Modena, attributed them to the early iron age. I have compared this unpublished plate, prepared by Professor Chierici, with the originals, but in spite of all my efforts have been unable to obtain any further information about them. Figure A

[1] I have to thank Professor Pigorini for his kind permission to publish it. It was found at S. Polo Enza, near Servirola ; is 5 centimetres in length, 3 centimetres in height ; the tail is broken.

seems to be a dog, the others are sows. In Fig. 121 I have collected some terracotta figures from the terremare of Montale,

FIG. 121.—ANIMALS DISCOVERED IN THE TERREMARE OF MONTALE. MUSEUM OF MODENA.

now in the Museum of Modena. Fig. 121, A, resembles a dog, the next, C, is perhaps a sow,[1] and the other three are probably

[1] Another similar figure of well-fired white earthenware, which came from Besenzone, near Piacenza, is in the Prehistoric Museum in Rome. It is 45 millimetres in height.

figures of bulls. All these figures are of local clay, well fired and with no trace of colouring.

3. NEOLITHIC FIGURES OF BIRDS

On comparing the neolithic figures of animals from Egypt and Crete with those from Troy and the terremare, no one would believe what a distance of space and time there is between them, yet the former belong to the neolithic age and the latter to the age of bronze and the beginning of the iron age. In this department of archæology there are other resemblances still more evident in the neolithic age. At Naqada and Gebelen there came to light in the excavations of Dr. Petrie and Mr. Quibell [1] some figures of birds exactly like those found in Liguria in the Cave of Pollera [2] and the Caverna delle Arene Candide by Don Morelli (Fig. 122). The figures from Upper Egypt are of marble, quartz, or bone. These resemblances prove the uniformity of neolithic culture, for it cannot be accident when conventionalised figures of birds are identical in countries so far apart. Two hypotheses present themselves, and I leave the reader to decide the question, contenting myself with pointing out the difficulty of explaining away the mutual resemblance of these statuettes. It is true they are figures so simple that they might have been fashioned by man in any country, but as we saw in Chapter XI., we must not put much faith in the inventive talent of primordial man.

FIG. 122.—TERRACOTTA BIRD, FOUND IN THE CAVES OF LIGURIA.

The hypothesis of an autochthonous artistic creation does not convince me, for I think it is incomprehensible that out of the many objects which primitive artists might have copied they

[1] Flinders Petrie and Quibell, *Naqada and Ballas*, Plate LX.

[2] A. Issel, *Liguria Preistorica*, p. 119.

should, from Egypt to the terremare, have had this one inspiration which led them to make the sow, the bull, the birds. The problem is more serious than it appears, and beyond these humble notes we perceive the grand picture of neolithic civilisation. In the midst of the darkness of prehistory these figures of animals are scattered fragments which point out the marine currents of the connection which from the Gulf of Genoa and Northern Italy extended to the Valley of the Nile.

CHAPTER XV

TUMULI (OR DOLMENS) OF SOUTHERN ITALY

I. DISTRIBUTION OF TUMULI

"ἀνδρὸς μὲν τόδε σῆμα πάλαι κατατεθνηῶτος,
ὅν ποτ' ἀριστεύοντα κατέκτανε φαίδιμος Ἕκτωρ."

Iliad, vii. 89–90.[1]

ACHILLES caused a tumulus to be made above the grave of Patroklos, it was 30 metres in diameter and stood upon a promontory so that it could be seen from afar. The Etruscans kept this type of tomb, which is still to be seen at Corneto Tarquinia. It must be instinct which guided man to give this form to a tomb, for it is found even among the Indians of America. Tumuli are diffused over a great part of Europe, where they are commonly known by the name of "dolmens,"[2] or megalithic monuments.

The dolmens mark the path of prehistoric commerce, which skirted the shores of Africa as far as the Atlantic, and after passing along the coasts of Spain and France ended at the British Isles. Another commercial road marked by dolmens is that which passes through Italy and the islands of Sardinia and Corsica, crosses France and Brittany, ending at the English

[1] "This is the barrow of a man that died in the days of old, a champion whom glorious Hector slew."

[2] *Megalithic* is a generic term applied to the monuments which we shall consider in this chapter, and, etymologically, signifies great stone. The Celts termed these tombs *Dolmen* (daul = table, moen = stone).

Channel. I shall return later to this route of the caravans which travelled from the mouth of the Rhone to bring tin from the Cassiterides Islands in Britain. The whole of Algeria is full of dolmens, and the illustrations published by Gsell [1] are identical with those of the Italian dolmens. We find in the Homeric poems numerous allusions to the prehistoric civilisation in Africa. The country of the Lotophagi (where Odysseus arrived after a storm) was a great emporium of Libya, where the caravans from Central Africa discharged. The Lotophagi were the predecessors of the Carthaginians, and had the monopoly of the trade from Central Africa, in what is now Tunis.

Diodorus relates that the tomb of Minos in Sicily was underground, and that above was a small temple of Aphrodite. Dr. Evans recently discovered a magnificent tomb of identical structure at Isopata, near Knossos. The ceiling of the great subterranean chamber was level with the ground above, and a small temple or large stele rose above the mound which covered the tomb. We shall see that this type of tomb is found all through Spain and Etruria, and finally reaches Ireland. The spread of the dolmens traces the current of civilisation which passed through prehistoric Europe; and it is a point worthy of consideration that tombs of the tumulus type should be found on the Western side of Europe, and be altogether absent from the Eastern side.

The prehistoric tombs of New Grange in Ireland resemble those of Crete and Mycenæ both in their architecture and their decoration of spiraliform design.[2] Near the sea a little beyond Dublin there are several tumuli which were probably constructed at the end of the bronze age or beginning of the age of iron, which for Ireland would be about 100 B.C. As the contents of these tombs are missing, the graves having been plundered very

[1] S. Gsell, *Les monuments antiques de l'Algérie*, 1901. For the pottery, *vide* Carton (*Découvertes épigraphiques et archéologiques faites en Tunisie*, Paris, Leroux, 1895), and Bertrand ("Monuments dits Celtiques dans la province de Constantine," *Révue Archéologue*, 1863, ii. 519).

[2] G. Coffey, *Transactions of the Royal Irish Academy*, xxx. 1892.

FIG. 123.—DOLMEN OF LEUCASPIDE, NEAR TARANTO, SOUTH.

long ago, we make use of the designs carved on the great stones which enclose the corridors and form the walls of the cupola and lateral chambers as a guide to the date of these tombs. These decorations are in the form of incised broken lines in lozenges and dog-tooth pattern, and also a design of branches and fern leaves. We cannot attribute to these tombs, covered by tumuli of earth, a date corresponding to the neolithic period, because the spiraliform designs with circles and interlaced *s's* show a distant resemblance to the motives of Mycenæan art. Of higher antiquity are the great tumuli of Portugal. A description of them by Dr. Paris [1] is identical with this of New Grange, and marks the path followed by this architectural type from South to North.

2. THE DOLMENS OF TARANTO

At Leucaspide, near Taranto, Dr. Luigi Viola took me to see a tumulus upon the estate of Signor Carlo Lacaita. This dolmen was excavated in 1884, and a description of it was published by Mrs. Ross in a romantic sketch, in which the giant's table is brought in without any information that could be of use to archæology.[2] Several vases had been discovered intact, but I was unable to find them, and had to content myself with the fragments which I found on renewing the excavations. The entrance to the tomb faces to the east (Fig. 123). Four large stones form a square covered by a great slab. The cavity is 1·30 metres in height, 1·17 metres in length (in the direction of the entrance), and 1·45 metres in width. We raised a great stone which had closed the entrance to the corridor; the posterior part is also closed by a slab, still held in place by the earth which formed the tumulus. The floor is formed of two large slabs. In front is the corridor, or *dromos*, made of large stones, 2·60 metres in length, 1·65 metres in width.[3]

[1] Paris, *Essai sur l'art et l'industrie de l'Espagne primitive*, 1903, p. 39.

[2] Ross, *Italian Sketches*, London, 1887, p. 257.

[3] The stone above, resting on vertical slabs, is 2·20 metres in breadth, 0·45 metre in thickness. From front to back it measures 2·95 metres. This great slab

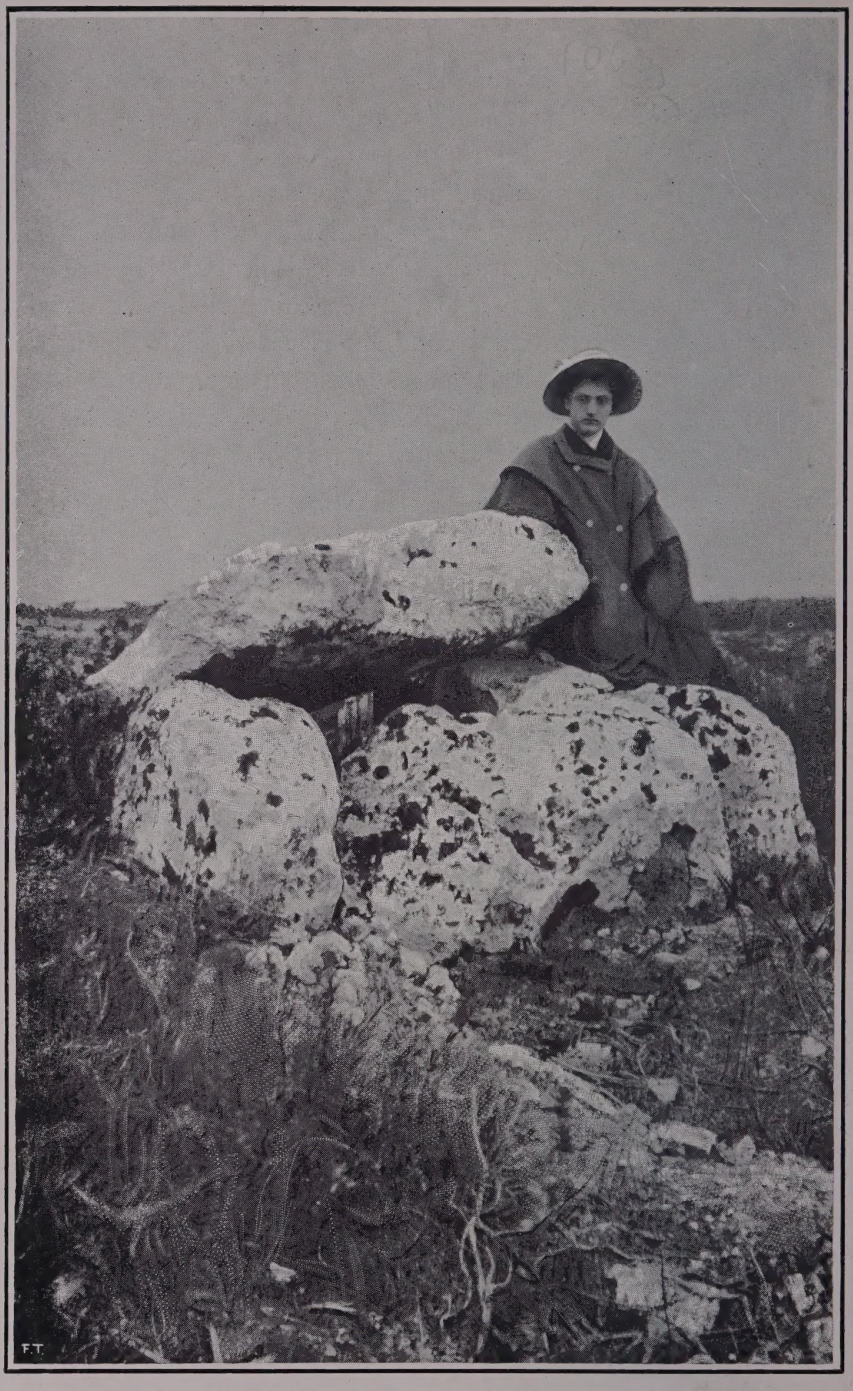


FIG. 124.—TUMULUS TOMB AT RICETTULLA, NEAR TARANTO.

The great stones stood in the midst of a tumulus of earth which is preserved on the north-western side, as may be seen in the photograph, and forms a cone 15 or 16 metres in diameter. The rains have corroded the tumulus, which must have been much higher and reached beyond the entrance corridor. The stones of the entrance corridor are mostly scattered about the dolmen, but some remain in place. When the tomb was cleared out five-and-twenty years ago, the earth which covered the entrance passage was removed also and thrown to right and left. Digging in this earth I found portions of human bones, and the vases which I will now describe.

Another tomb of the tumulus type stands a little farther on, near the Ricettulla property, which belongs to Signora Giulia Cordiglia (Fig. 124). I will not stop to describe this dolmen, in which I found no trace of either pottery or bones. I only note that remains of the tumulus of earth still exist round the stones of the dolmen.

3. POTTERY FROM THE DOLMEN OF LEUCASPIDE

At Leucaspide, when digging in the earth which had been left heaped up by the first excavators, we found fragments of vases, great and small, fine and coarse, of brown, drab, and black earthenware. A few of the fragments are decorated with deeply incised parallel lines, as may be seen on Fig. 125, which represents the handle of a bowl; it terminates in a flat expansion, pierced by a triangular opening. Fig. 126 represents the side view of this handle, which had been raised above the edge of a large shallow tazza, having a diameter of about 20 centimetres. We found another handle of the same shape, of reddish-brown earthenware, smooth and without incised decoration. The

rests on two vertical stones. That to the left, *i.e.*, on the south, is 1·90 metres in length, 1·40 metres in height, 0·30 metre thick. The other, on the right, to the north, is 1·90 metres in length, 1·35 metres in height. The stone which closed the entrance is 0·95 metre in height, 1·15 metres in breadth, 0·30 metre thick.

FIG. 125.—POTTERY FROM THE DOLMEN OF LEUCASPIDE, NEAR TARANTO.

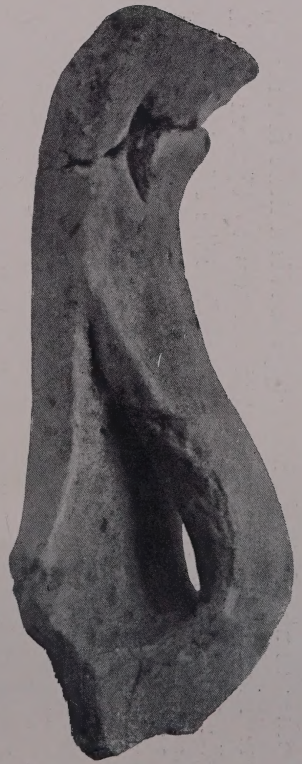


FIG. 126.—HANDLE OF PRECEDING VASE. SIDE VIEW.

FIG. 127.—HANDLE OF A VASE FROM THE DOLMEN OF LEUCASPIDE.

pottery of the dolmens has been hitherto little known, because the excavations have been executed unmethodically, even in countries where the study of palæethnology is better understood.

Some large open vases, 22–24 centimetres in diameter, had a large flat handle, with a diameter of 45 millimetres, terminating in a semicircular projection, below which the flat body begins (Fig. 127). There are some similar cups smaller and thinner, and of very fine texture.

The handles of some of the vases were triangular, with the upper angles somewhat blunted and curving back, projecting very little above the edge of the vase, as in Fig. 128. Others are longer and formed of a strip turned back, as in Apulian and Siculan pottery. I was able to restore one vase out of two fragments (Fig. 129). It is a large earthenware bowl about 16 centimetres in diameter, reddish in colour outside and black inside with white specks. The body is globular in shape. I think it may have had a handle at the edge like Fig. 128. There were similar cups of black earthenware well polished with the stecca, shallower, and with the edge curled back on the outside.

FIG. 128.—HANDLE OF A VASE FROM THE DOLMEN OF LEUCASPIDE.

Others have ribs like cords attached to the shoulder and passing down the body of the vase.

I illustrate the half of a coarse brown earthenware basin with a handle, not well polished like the preceding vases (Fig. 130), 13 centimetres in diameter at the edge, 10 centimetres in height inside the cavity, the sides are 1 centimetre thick, the handle is formed of a flat band 8 millimetres thick, with angular aperture projecting 1 centimetre beyond the edge of the basin.

The resemblance of this pottery to the neolithic ware of the Pulo is evident in the form of the handle.[1] The bowls,

[1] M. Mayer, *Le Stazioni preistoriche di Molfetta*, Bari, 1904.

such as Fig. 129, resemble the pottery of the first Siculan period, which came from the tombs of Monteracello, and has been published by Professor Orsi. These comparisons prove the extreme antiquity of the dolmens of Taranto.[1]

A large vase of the diameter of 28–30 centimetres, 1 centimetre thick, probably globular in shape, of which only the shoulder has been preserved, has, instead of a handle, a crescent-shaped projection turned downward, measuring 7 centimetres in diameter and projecting to a height of 8 millimetres above.

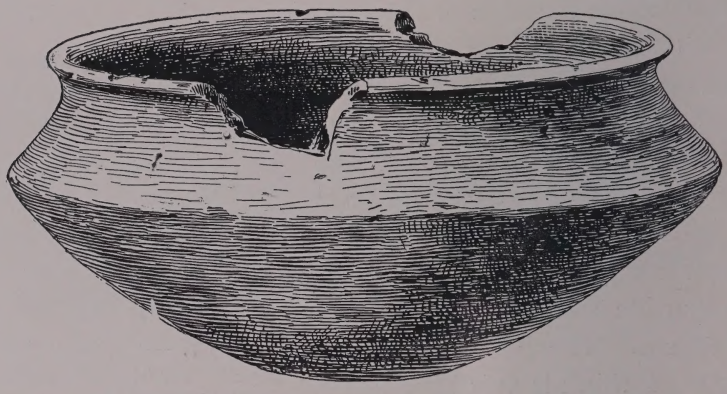


FIG. 129.—BOWL OF REDDISH CLAY RECONSTRUCTED FROM TWO FRAGMENTS.

Among the handles was an indication of the crescent-shaped handles, of which there was a great development in the terremare.[2] At least I think that the handle of Fig. 131, made with a curve to form a rest for the fingers, can be so interpreted. On the left side an incised line marks a decoration similar to that of Fig. 125. A piece of a black cylindrical vase is of archaic type (Fig. 132); it is highly glazed and ribbed, and exactly like the neolithic pottery of Phæstos—a type which is also common in the neolithic strata of Upper Italy.

The most important piece of pottery in this dolmen is a

[1] Orsi, *Bullett. paletn. ital.*, xxiv. 1898, Plate XXII. Fig. 4.

[2] *Bullettino paletn. ital.*, xv. 1889, p. 65.

libation table similar to that which came to light in the palace of Phæstos, published by Dr. Pernier.[1] Fig. 133A shows one fragment in profile, and Fig. 133B consists of two pieces put together. The interior has a diameter of 10 centimetres, thickness 15 millimetres, depth 22 millimetres. The external and internal surfaces are parallel. There is no edge on

FIG. 130.—BOWL OF COARSE EARTHENWARE FOUND IN THE DOLMEN OF LEUCASPIDE.

the fragments, so we may conclude that this basin was larger than appears in the illustration. The clay is fine, black, and well polished, and the vase corresponds in size to that at Phæstos. The fact of there being two vases identical in form, dimensions, and the quality of the ware found, one in the primitive palace of Phæstos and the other near Taranto, may serve as a basis for the chronology and for the

[1] *Monumenti Antichi*, Lincei, xiv. 1905, p. 180.

origin of the pottery in the dolmens. Even the decoration of the libation table found at Phæstos is similar to the decoration of the pottery in the dolmens of Taranto, consisting as it does of two deeply incised circular lines round the cavity, and two outside the edge. Some large vases in the shape of a flower-pot have the flat base 12–13 centimetres in diameter. The sides form an angle of 60° with the plane of the base. Though the clay of which it is made is coarse and more than a centimetre thick, the vase is polished below and all round.[1] There are bowls of various shapes, like those of the neolithic strata at Phæstos,

FIG. 131.—FRAGMENT OF A CRESCENT-SHAPED HANDLE.

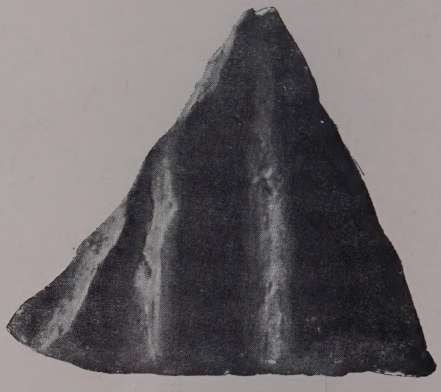


FIG. 132.—FRAGMENT OF A CYLINDRICAL BLACK RIBBED VASE.

with the base flat and slightly concave, and the sides inclined at an angle of 40° ; others also have the base slightly concave, with a rim 1 centimetre in height round it.

The relation of the pottery from the dolmen at Leucaspide with the neolithic pottery is evident. Several of the vases had the neck 4 centimetres in height, well sloped out in funnel form, with the edge turned back on the outside, the body globular, with sides 5 millimetres thick, well worked and smooth inside and out.

[1] One vase from this dolmen resembles another found in the Tomb Ca di Marco, in the Bresciano, with two bell-shaped cups, described by Colini (*Bullettino di paletn. ital.*, xxiv. 1898), which belong to the beginning of the age of copper.

Some of these vases had a diameter of 30 centimetres. Others were coarse, of cylindrical shape, above 20 centimetres in diameter,

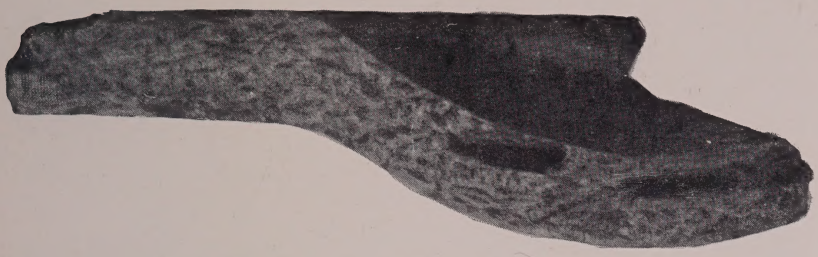


FIG. 133*a*.—FRAGMENT OF A LIBATION TABLE. SIDE VIEW.

and 15 millimetres thick, slightly sloped, and these vases were not polished. The clay was always mixed with charcoal and

FIG. 133*b*.—TWO FRAGMENTS OF THE LIBATION TABLE REPAIRED.

broken rock, which was the cause of the white specks in the black substance of the interior of the vases ; the surface was red from the action of the fire where the heat was intense.

It seems probable that the dolmen of Leucaspide may have been constructed at the end of the neolithic period or at the beginning of the age of bronze.

4. MEGALITHIC MONUMENTS IN TERRA D'OTRANTO

In the province of Otranto I photographed several dolmens, of which I reproduce the pictures. It will be seen at once that the

FIG. 134.—DOLMEN OF MINERVINO, LECCE.

tombs as they are now would not serve to put a body in, and that the tumulus of earth which covered the tomb is no longer there. The stones which stand upon the bare rock represent the nucleus of the tomb. The earth which covered these stones up to a certain height to close the entrance passage has disappeared, while it still remains—or a good part of it—on the two dolmens near Taranto. Fig. 134 represents the dolmen of Minervino,

FIG. 135.—DOLMEN OF GIURDIGNANO DELLE CHIANCUSE, ON THE ESTATE OF THE ONOREVOLE EPISCOPO.

uncovered by the Avv. Luigi Maggiulli in 1867.[1] The stones rest on the tufaceous ground, and above them is a slab with a hole in the middle; for this reason I reproduce the photograph, though it has been published repeatedly.[2] An aperture in the stones of a dolmen is common in France and Syria and other countries. We do not know the reason of this aperture in the dolmens, possibly it indicates a belief in the soul, and was to enable it to get in or out of the tomb. This analogy between the dolmens spread over so wide a surface of the ancient world is of use towards the comparative history of the races of Europe.

Professor Orsi[3] discovered at Monteracello two tombs of a type new to Sicily. They were formed of slabs of calcareous stone; the covering slab was in place and the skeletons were still in the tomb. Professor Orsi recognised these sepulchres as true dolmens. The skeleton found in the tomb was in a contracted position, and besides a few sherds there was a piece of worked flint. In the side of one of these tombs was a small window. That these dolmens are of the first Siculan period is of some assistance in dating them. The photographs of two other dolmens, at Giurdignano, are here reproduced (Figs. 135, 136); they were discovered by Avv. Pasquale Maggiulli in 1893. In all the dolmens of Terra d'Otranto the tumulus of earth has disappeared, partly through the action of inclement weather, and possibly also

[1] Length of the upper stone, 3·50 metres; breadth, 2·50 metres; thickness, 40–50 centimetres; height from the ground, 1·04 metres.

[2] Professor Pigorini, to preserve a record of these dolmens, caused some to be photographed, and published them in his *Bullettino di paletnologia* (*Monumenti Megalitici di Terra d'Otranto*, 1899, p. 178). They include the dolmens of Ferracavallo and Minervino (Plate IX.), the menhir of Giurdignano, the dolmen of Grassi, the menhirs of Zollino and of Merina, the dolmen of Chiancuse. A dolmen of Birori, near Cagliari, has been published by Taramelli (*Bullett. paletn. ital.*, 1906, p. 268). Nicolucci had already published illustrations of seven dolmens in a work to which I shall refer later. The illustrations, however, left much to be desired. The series of photographs begun by Professor Pigorini of the dolmens now known in Southern Italy is completed by the three photographs which I now publish.

[3] Orsi, *Bullettino paletn. ital.*, xxiv. 1898, p. 201.

FIG. 136.—DOLMEN OF GIURDIGNANO, ON THE GENNACCARI PROPERTY.

by having been spread over the tillage soil upon the rocky surface of the surrounding land.[1]

In Tuscany there are tombs constructed like the dolmens,[2] having a passage 1 metre in width and 5 or 6 metres in length, made of great slabs of stone with one above to cover in the square tomb. Professor Umbrozo 3 has also described some in the district of Cortona in Etruria. Professor Issel, in a lecture delivered this year before the Ligurian section of the Italian Alpine Club, advised the young members who loved the mountains to seek out these monuments in Liguria, and specially near Porto Maurizio. The great master of Ligurian palæthnology is convinced that there are some to be found, because they exist in considerable numbers in the French departments of the Alpes Maritimes and Var.

I fear that by degrees all the dolmens of South Italy will be destroyed. During my stay in Terra d'Otranto I tried to persuade influential persons to try to have them declared national monuments by the Government, and so saved from devastation. A few years ago there were eight, and now only seven remain.[4]

[1] The lower surface of the horizontal slab is about 1 metre from the rock floor of the tomb. In the dolmen of the Chiancuse (Fig. 135), the calcareous slab which forms the covering of the tomb is 3·35 metres in length, 2·60 metres in breadth, 0·32 metre thick. The dolmen of Fig. 136 is covered in by a stone 3 metres in length, 2·55 metres in breath, 0·17 metre thick. At Giurdignano, in the dolmen of Sudili, on the estate of Signor Cosi, the upper slab of trapezoid form is broken, its length is 3·80 metres, width 2·60 metres, thickness 0·35 metre, height 0·95 metre. In another dolmen at Giurdignano, on the Stabile estate owned by Signor Gennaccari, the upper slab measures, length 3 metres, breadth 2·55 metres, thickness 0·20 metre. Other three dolmens exist on the Garzia estate on the Paletta farm, and on the Orfine estate of Signor Rizzo. I have to thank the Avvocato Pasquale Maggiulli who kindly accompanied me on this expedition.

[2] G. Pinza, "Le origini di alcuni tipi dell' architettura sepolcrale tirrena nell' età di ferro," *Congresso internazionale di Storia, Sezione iv., Archeologia*, pp. 378–480. J. Martha, *L'art étrusque*, p. 183.

[3] Umbrozo, *Congrès d'Anthr. et d' Archéol. préhistor.*, 1866–7, p. 219.

[4] Professor Nicolucci has already deplored the destruction of the dolmen of Cocumola (*Brevi note sui monumenti megalitici di Terra d'Otranto, Accademia Pontoniana*, 1893, p. 8).

5. THE DOLMEN OF BISCEGLIE

The largest and best preserved of the dolmens now known in Italy was discovered by me, in company with Don Francesco Samarelli, at Bisceglie in the province of Bari, August 6, 1909. While we were intent on searching for the traces of neolithic villages like that of the necropolis of the Pulo, which I had discovered, a peasant came and told Don Francesco Samarelli of a certain stone hut upon his master's land, and so we discovered this dolmen, which lies near Molfetta at about 1½ hours' drive from the Pulo, and just 6 kilometres from Bisceglie, on the high road to Ruvo, upon an estate belonging to Signora Lucietta

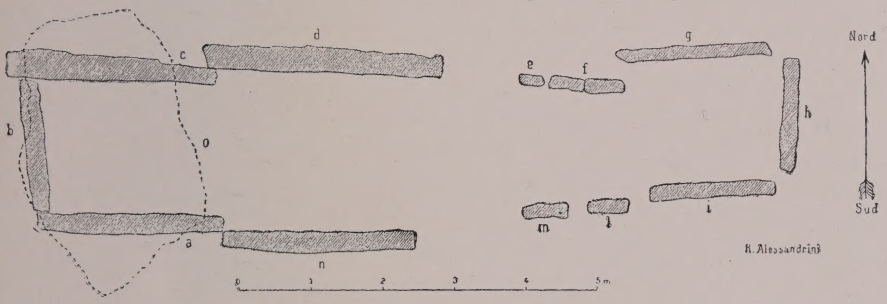


FIG. 137.—PLAN OF THE DOLMEN OF BISCEGLIE.

Berarducci-Pasquale, in the part called *la Chianca*. This dialect word signifies *the table*—and doubtless the name originates in the principal part of the monument, and concides with the term used by archæologists—dolmen being a Celtic word signifying table of stone.

Fig. 137 shows the position of the stones forming this dolmen, and the photographs (Figs. 138, 139, 140) show the tomb on the north, west, and south sides. The quadrangular cella is formed by three enormous slabs, *a*, *b*, *c*, fixed vertically in the ground (Fig. 137).[1]

The importance of this dolmen consists in its being complete, with the dromos or corridor giving access to the central tomb,

[1] Of the lateral slabs, *c* measures 3 metres in width, 2·10 metres in height; the other, *a*, is 2·50 by 2·12 metres; the third, *b*, is 1·95 by 2·05 metres. The upper slab, which forms the roof, is 3·95 metres long, 2·40 metres wide, 0·25 to 0·43 metre thick.

which was closed in by a tumulus of earth. The corridor, of which the lateral slabs are indicated on the plan, was 7·80 metres

FIG. 138.—DOLMEN OF BISCEGLIE, FROM THE NORTH.

long, 2·30 metres wide near the cella, and only 1·70 metres wide at the entrance; as is generally the case with the dolmens this

faces east. Before it was excavated the tomb only stood 1·65 metres above the ground, but now it is 2·10 metres in height

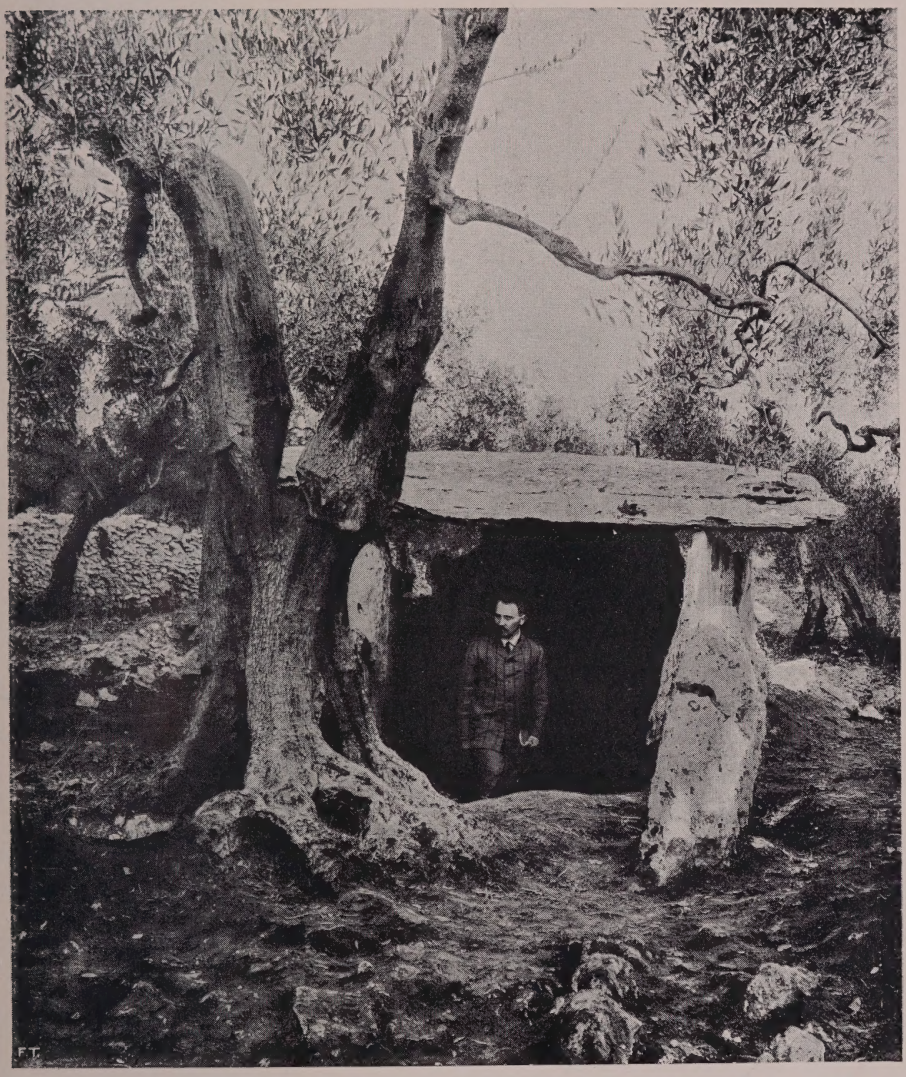


FIG. 139.—DOLMEN AT BISCEGLIE, FROM THE EAST.

from the rock floor to the roof slab. In the lateral slab *a* of the cella and towards the upper part there is an oblique opening,

through which the fist could be passed, like that formerly recorded in the case of the dolmen of Minervino.

FIG. 140.—DOLMEN OF BISCEGLIE, FROM THE SOUTH.

In excavating the sepulchral chamber the bones of a child, of a woman, of an old man, and of three adult men were found, besides several fragments of vases, part of a necklace in well-baked clay

beads, in the shape of two sections of heptagonal pyramids united at the base, one pyramid-shaped stone, with a hole through it, possibly to enable it to be worn as an amulet, a flint rounded like a hammer, a large broken flint knife, a small knife of obsidian, an infinite variety of bones of a bull mixed with ashes and charcoal—doubtless the remains of funeral feasts in honour of the dead. The skeletons were scattered in disorder, except that one had the legs doubled back upon the thighs, which were bent up against the body in the characteristic position of the bodies in neolithic interments. When the sepulchral chamber was full other bodies were buried in the corridor, as was also the case in Crete in the great tombs of the Minoan age, of the type with dromos. When excavating in the direction of the entrance, therefore, we found three skeletons with the skull of dolichocephalous type, and also two great vases set against the walls of the corridor.

Judging from the pottery found among the skeletons of the cella and the two nearly perfect vases which stood near the skeletons in the corridor, I believe this dolmen to have been constructed about the end of the neolithic age. This will be more clearly shown in a paper on the pottery which will appear shortly in the *Bullettino di paletnologia italiana*.

Not a trace of metal was found in the earth or among the bones of the skeletons, and I found no mark of verdigris on the rock floor on which the bones were scattered ; this could hardly have been the case if any objects of metal had been placed near the bodies.

Dr. Montelius [1] has collected the bibliographical notices on the two currents which may have distributed the dolmens in so unequal a manner over the surface of Europe. Some palæethnologists believe that the dolmens came from the East, while others maintain that they spread from the north of Europe towards the south.

The dolmen of Leucaspide and that of Bisceglie afford proof, by their pottery, in contradiction of the latter theory, and no evidence has ever been found to show that in the neolithic age

[1] O. Montelius, *Der Orient und Europa*, Stockholm, 1899, p. 30.

any race of men has crossed the Alps to come down into Italy. Nor could the less developed civilisation of Northern Europe influence, by means of commerce, the people who constructed the dolmens of Taranto and Bisceglie in the neolithic age. These two dolmens, of which I have made a study, are the most ancient now known, and those of which it is possible, by means of their pottery, to establish most nearly the time to which they belong.

The absence of dolmens in the East is a grave fact, as it cannot be asserted that these tombs were in use in the Valley of the Nile; this is another reason for not attributing too much importance to the extreme East in the history of Mediterranean civilisation. Possibly the large number of dolmens found in Cyrenaica points to the influence of Northern Africa upon the civilisation of the Aegean and of the Continent of Europe.

As we do not know exactly the age of the dolmens of Africa which extend as far as the Soudan, any assertion as to the origin of the dolmens and the currents which spread them along the surface of Europe is at present premature. As for the age of the dolmens, Dr. Montelius [1] says that the most ancient dolmens in Scandinavia date back to the first half of the third millennium before the Christian Era, and possibly even further back; this date agrees with the probable age of the dolmen of Bisceglie. In my recent excavations on the Pulo and in the country round Molfetta I found coloured neolithic pottery identical with that discovered at Phæstos, in Crete, below the Minoan palaces. This pottery from the settlement of the Pulo must be dated at least four thousand years back if it is contemporaneous with the similar Cretan pottery. The vases from the dolmen of Bisceglie are less ancient than those of the neolithic necropolis of the Pulo, but possibly earlier than the introduction of copper and bronze. These vases with their knobs and their shape are identical with those which came to light in the surrounding neolithic settlements. Other sherds of black, well-refined paste with a finely polished surface are characteristic of the last neolithic period. If

[1] *Op. cit.*, p. 35.

we consider that it would take nearly a thousand years for the dolmens to spread from the South of Italy to Scandinavia, we may be satisfied with such coincidence of dates as will bring the last period of the neolithic age in Italy to about 4000 B.C.

6. THE DOLMENS OF MATERA

At Matera, in the district of San Martino, Dr. Ridola discovered a sepulchre similar to the dolmens, built of four great slabs of rough stone, each above a square metre in size, forming a rectangular cavity covered by a larger slab. Within was the skeleton in a contracted position of a young woman, whose cranium he has preserved in his museum. Near the head stood a large spherical vase with cylindrical neck of good clay. At the feet stood another and smaller vase of the same shape, of black earthenware with a decoration of cords in relief, similar to a fragment which I found in the dolmen of Leucaspide. I examined these two vases at Matera, and found that they differed little from those described in this chapter, and I am therefore inclined to consider them contemporaneous.

Another dolmen was discovered by Dr. Ridola in the Parco dei Monaci near Matera ; it is constructed of great rough slabs fixed in the tufo round a quadrangular trench dug out upon the summit of a mound. The great stones have only the lower part sunk in the ground, and stand up round the cavity of the trench, from which I dug up two daggers and an axe with flanged edges, published by Professor Pigorini.[1] A double-edged dagger blade, 11 centimetres in length, with two small rivets to fasten to the handle, is so much oxidised that it is impossible to say whether it is of copper or bronze, but the large dagger is certainly of copper, both handle and blade, the latter of triangular form. It is 18 centimetres in length, has a slightly raised rib down the middle, and is fixed to the handle with eight little rivets. Similar daggers are frequently found in Upper Italy, the finest being in the Museum at Parma ; there are some at Milan also, which came

[1] *Bullett. paletn. ital.*, xxvi. 1900, p. 9.

from the Cascina Ranza.[1] Dr. Montelius, who has studied the diffusion of these daggers in Northern Europe, considers these to be identical with the daggers of the early centuries of the second millennium in Scandinavia[2] and various parts of Central Europe. I reproduce the figure of a dagger found in Mecklenburg, which

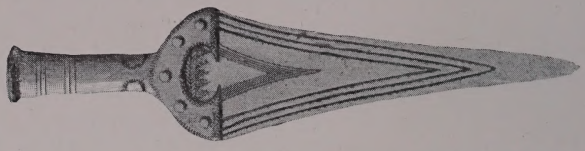


FIG. 141.—ITALIC DAGGER FOUND IN MECKLENBURG.

is identical in form with that from the Parco dei Monaci, near Matera, but is less ancient, for the last-named dagger is of copper and not chiselled. Dr. Montelius explains the importation of weapons into Scandinavia by the trade in amber, and we will return to the subject later, for even in the fourteenth and fifteenth centuries B.C. amber was brought from the Baltic into Greece.

7. COMPARISON OF THE ITALIAN DOLMENS WITH THOSE OF OTHER COUNTRIES

The recent publication of Professor Paolo Orsi upon the proto-Siculan tombs of Gela contains illustrations of a pottery somewhat resembling that of the dolmens,[3] and some of the bowls are identical in shape. The difference of the pottery of the dolmens from that of the terremare, and from the Siculan pottery of the first period, enables us to recognise in these tombs traces of the current which passed from the shores of Africa into Spain, Sardinia, and Italy, and spread towards France and Northern Europe.

[1] Mosso, "Le armi più antiche di rame e di bronzo," *R. Accad. dei Lincei: Classe scienze morali*, 1908, p. 570.

[2] O. Montelius, "Le relazioni fra l'Italia e la Scandinavia prima di Augusto," *Atti del Congresso internaz. di Archeologia*, Roma, 1904, p. 240.

[3] Orsi, "Sepolcri Protosiculi," *Bullett. paletn. ital.*, xxxiv. 1908, p. 119, Plate III. Fig. 4.

The female idols of the dolmens of France are another landmark in the chronology of the megalithic tombs. Besides the menhirs of Sardinia, which represent a woman, and which I have already considered, others have been found in France.[1]

The character of the pottery of the dolmens of Taranto and Bisceglie explains how this special form of burial appeared in France and Northern Europe at the last period of the stone age and the beginning of the bronze age. Dr. Penka (representing one of the two currents of opinion into which palæethnology is now divided) believes that the dolmens were certainly constructed by the Indo-Germans,[2] but as the dolmens are not found in Central Europe, along the Rhine or in Hungary, Dr. Montelius argues that this form of burial cannot have been brought with them by the Aryans in their migrations.[3]

Some, like Dr. Zinck of Copenhagen, attribute importance to the fact that objects of bronze are found in the dolmens of the South, while only stone weapons are found in the dolmens of the North. This, however, was due to the mode of progress of civilisation from south to north, and cannot be interpreted as proof of the diffusion of dolmens from the north towards the south. The Italian dolmens with their pottery will, I hope, be of use in putting an end to the discussion which has only recently been raised again. Dr. Much[4] and others hold that the dolmens of Central and Northern Europe are the originals of the Mycenæan cupola type which came to light in the excavations of Dr. Schliemann. We now know that the tombs of the dolmen type are more ancient than the Mycenæan temples. In the recent work

[1] Déchelette, *Manuel a'Archéologie*, 1908, p. 597.

[2] Penka, *Die ethnologisch–ethnographisch Bedeutang d. megalith. Grabbauten*, Wien, 1900.

[3] Dr. Montelius based his studies more especially on Scandinavia, where the megalithic monuments have been more methodically examined than elsewhere. His classification and chronological comparisons have been favourably received by the majority of archæologists (Montelius, *Der Orient und Europa—Einfluss der orientalischen Cultur auf Europa bis zur Mitte des letzten Jahrhunderts v. Chr.*, Stockholm, 1899, p. 163).

[4] M. Much, *Die Trugspiegelung orientalischer Kultur*, p. 129.

of Dr. Mayr [1] is a description of the tombs of dolmen type in Malta which belong to an earlier age, and show signs of Minoan influence with traces of the pillar cult, and also of the conical monoliths which resemble those of Sardinia.

8. THE BELL-SHAPED CUP

The bell-shaped cup was discovered in Sicily, and is characteristic of the epoch of the dolmens in Northern Europe. The illustration (Fig. 142) is from one discovered at Villafrati, near Palermo.[2] Similar cups have come to light in the valley of the Po and on the hut foundations of Reggiano, with copper weapons which I will describe presently. Thus we may say that the bell-shaped cup appears in the age of copper or of bronze, as may be argued from the pottery. The decoration of the vases which I found in the dolmens of Taranto and Bisceglie does not resemble that of the bell-shaped cups. This is worthy of attention ; for, at a time probably earlier than the dolmens of Taranto and Bisceglie, there was in the neolithic settlement on the Pulo, near Molfetta, pottery decorated with bands both plain and filled with small sloping lines, exactly like the decoration of the bell-shaped cups characteristic of the dolmens of Southern Italy and of my excavations at Coppa Nevigata.[3] Some of the German archæologists persist in the theory that the bell-shaped cups come from the North. Dr. Much [4] reasons that it is generally allowed that it takes one thousand years for a model to reach the north

[1] A. Mayr, *Die Insel Malta im Altertum*, 1909.

[2] Von Andrian, *Prähistorische Studien auf Sicilien*, p. 40, Plate IV. Height of the vase, 12·5 centimetres, diameter of the mouth, 11·5 centimetres. Professor Pigorini has treated this subject in a masterly fashion ("Scoperte paletnologiche nel Territorio di Modica in Sicilia," *Bullett. paletn. ital.*, anno viii. p. 20). We have also for this subject the very accurate work of Professor Colini (*Bullett. paletn. ital.*, xxxiii. Plate VI. Fig. 4, Plate VII. Fig. 6. Colini, "Rapporti fra l'Italia ed altri paesi europei durante l'età neolitica," *Atti Società romana d'Antropologia*, vol. x. 1904. *Bullett. paletn. ital.*, xxiv. p. 253, Plate XXVIII. ; xxvii. Plates V. VI.

[3] *Monumenti Antichi*, 1909, vol. xix.

[4] M. Much, *Die Trugspiegelung orientalischer Kultur*, 1907, p. 7.

from Mycenæ; therefore as these cups are found earlier in Northern Europe they cannot have originated in Mycenæ or the Aegean. It must, however, be observed that these cups are much earlier than the Mycenæan period, for we find them in

FIG. 142.—BELL-SHAPED DRINKING-CUP FROM VILLAFRATI, NEAR PALERMO.

Upper Italy during the age of copper, and in the South before the age of bronze. As for Dr. Much's assertion that the bell-shaped cups in southern countries are less handsome than those of the North, it is enough to look at the illustration (Fig. 142) to be convinced of the contrary. Finally, I will recall what Sophus Müller says: "Types of utensils, weapons, and ornaments may

be preserved almost unaltered for a considerable time, especially when they are transmitted to fresh regions. The bell-shaped cup in Sicily must have belonged to a period of small sepulchral chambers of greater antiquity, while in Denmark they are found in the chambers of the giants, which must have been derived later and enlarged from these primitive chambers."[1]

9. "STANDING STONES" OR MENHIRS

Monoliths, or, as they are called in the country, "standing stones," are often met with in the Terra d'Otranto. At Giurdignano I saw seven fixed not far apart in the fields. One of these, which is near the parting of the ways at S. Vincenzo, just before the entrance to the Commune of Giurdignano, is shown on Fig. 143. Professor De Giorgi of Lecce, who has made a study of this subject, has seen seventy-eight.[2] They are scattered here and there in the fields,[3] and when I saw them I thought of the stones mentioned in the Bible, when Moses set up twelve on Mount Sinai and Joshua[4] after crossing the Jordan set up other twelve, and of that famous one which Jacob set up and consecrated after a dream, when he was going to seek a wife in Mesopotamia.[5]

Though we have no information as to their age, the standing stones of Terra d'Otranto are probably monoliths which connect our civilisation with that of the East.[6] With reference to the age and origin of these "standing stones" I here recall that, in company with Don Francesco Samarelli, I discovered at Monteverde, near Terlizzi, a bætylic sanctuary which certainly belongs to the neolithic age. In consequence of these excavations in the province of Bari it is now demonstrated that pillar worship dates

[1] Sophus Müller, *Urgeschichte Europas*, p. 55.

[2] De Giorgi, *Rassegna settimanale di Roma*, anno v. n. 115, March 1880.

[3] Besides this of Giurdignano, Professor Pigorini, in the above-quoted paper, has published photographs of the menhirs of Zollino and Merina.

[4] Joshua iv. 21, 22.

[5] Genesis xxviii. 22.

[6] The word *menhir* is from the Breton and signifies *long stone*.

FIG. 143.—MENHIR, OR "STANDING STONE" OF GIURDIGNANO, TERRA D'OTRANTO.

back to the neolithic age, and our former theories as to the origin and significance of these menhirs must be modified. We might call them obelisks, but the term is not quite applicable, as these menhirs are rectangular stones with rough surface. An obelisk is indeed a monolith, but it is of greater size and rests upon a base. I believe that the "standing stones" belong to the bætylic cult and date back to the stone age. Their connection with religion is less clear in the case of the stones with two breasts carved on them found in Sardinia and France.[1]

In Brittany and in England colossal stones have been set up, by what would seem to be the work of giants, in which hundreds of men must have taken part. An inventory has been made of the colossal stones of France, and the number still amounts to about fifteen hundred, but who knows how many have been destroyed. There is a very fine one about 5 metres in height in the fields, in front of the station of Giurdignano. I asked a peasant why these stones had not all been removed and destroyed, and he said they were sacred, and then added with a sarcastic smile: "It is difficult to remove them, and those who have tried found it hard work. They are fixed so deep down in the ground that it is not worth while to dig far enough to uproot them."

[1] G. de Mortillet, "Menhirs mamelonnés de Sardaigne," *Bulletin Société Anthropologique*, 1888, p. 257.

CHAPTER XVI

THE COLORATION OF THE BODY AND THE STAMPING OF PATTERNS ON THE SKIN

I. PATTERNS DRAWN ON THE BODY IN THE NEOLITHIC AGE

IN the Museum of Turin there is a figure of a woman made of clay dried in the sun, 25 centimetres in height, which was found at Luxor (Fig. 144, A, B). It seems to represent a woman kneeling, but no feet are indicated, and the posterior part is much developed. The nose is shaped like a beak in the form characteristic of neolithic figures. The eyelashes are blackened in the fashion still followed by actresses, and a broad line of green encircles the eyes. In the wall paintings of the earliest dynasties the dancing women have their faces and bodies painted, showing that this was a mark of elegance.

This fashion lasted long in Egypt, for even in excavations of the time of the XIth Dynasty the stone palettes are found with the green colour upon them, and also the spatula with which the powdered malachite was mixed, probably with water or grease, to form the pomade used for the toilet. The form of the statuette (Fig. 144), with its flat body and the rounded stump in place of the arms, is the characteristic one of the neolithic idols. Fig. 144, B, shows a black girdle and a design of semicircles also in black round the girdle. Coarser black lines are marked on the thighs. The decoration on the back is more complex (Fig. 144, A). There are three animals with long horns and hairy hide, and lower down are other and indecipherable marks.

At the back of the head hang the tresses of black earth, in which the undulations of the curls are made with great care. This detail is characteristic of the Mediterranean race, the Asiatics having neither wave nor curl in their hair.

Other neolithic figures discovered by Dr. Petrie and Mr. Quibell[1] at Naqada in Upper Egypt have also drawings of animals on the back, and there were goats exactly like these.

2. COLOURS USED FOR PAINTING THE BODY

Professor Schiaparelli discovered at Heliopolis in Egypt, at a depth of 8 metres, in neolithic soil, some lumps of yellow, blue, green, and red colouring matter, probably used for painting the face. Malachite, galena, ochre, and hæmatite were the substances used for colouring in green, white, yellow, and red. In France, too, in the neolithic age, red, yellow, and black colouring substances were used in the toilet. The slate palettes of the dolmens of Aveyron are of the same form as the Egyptian ones.[2] Ochre and hæmatite are commonly found in the tombs of the neolithic age in Germany.

The small pestles which we found at Phæstos and in the excavations at Cannatello in Sicily were possibly used for pounding the paints and ochre. Palettes of slate or marble, with a depression in the centre, supposed to have been used in preparing the colours for painting the face, have been found in nearly all the prehistoric tombs of Egypt, and near these palettes were shells still marked with the colour or little bags full of paint with a pebble.[3]

Women made great progress, and Ovid found little to add to the corrupt counsel in his writings, to increase the attractions of the women of Rome. The use of rouge and the desire to beautify and paint oneself is more ancient than civilisation, and

[1] Plate LIX. Fig. 6.

[2] Déchelette, *Manuel d'Archéologie préhistorique*, p. 566.

[3] Carbonate of lead for white and sulphur of antimony for black may be added to the list of colours used in the toilet of women in prehistoric times.

should not be regarded as a symptom of corruption in women, but rather as an instinctive tendency.

A B

FIG. 144.—EGYPTIAN FIGURE OF UNBAKED CLAY, WITH DECORATION OF ANIMAL FIGURES.

In the pre-Mycenæan age it was the custom to paint one's face with dotted lines across the forehead, cheeks and chin ; this

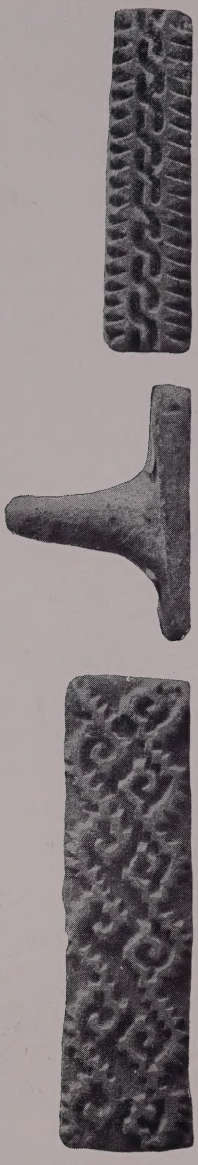


FIG. 145.—"PINTADERAS" FROM MEXICO.

appears in a Greek statuette from Seriphos described by Dr. Blinkenberg.[1]

Julius Cæsar wrote that in Britain every one painted themselves with a blue colouring similar to the indigo extracted from *Isatis tinctoria*, a plant cultivated up to the present time, and termed by the Latins *vitrum*.[2] Herodian[3] added that the Britons drew figures of animals upon their bodies. The uniformity of fashion during the neolithic age appears therefore evident in all the Mediterranean countries with whose prehistoric antiquities we are acquainted; for the custom of painting the body lasted up to the Mycenæan age, and even as late as the beginning of the Christian Era in the southern countries of Europe.

3. THE "PINTADERAS"

I here illustrate three *pintaderas* (Fig. 145) from Mexico, now in the Archæological Museum of Turin. They are a sort of stamp made of terracotta and were used to impress patterns upon the skin. The handle is shown in profile in the centre figure. Other and larger designs exist, but these are sufficient to explain their use.[4]

When the Spaniards arrived in South America they saw that the indigenous population impressed designs like these in bright colours

[1] Blinkenberg, *Mémoires de la S. R. des Antiquaires du Nord*, 1896, p. 48, Fig. 13. [2] *De Bello Gallico*, v. xiv. [3] Herodian, iii. xiv.

[4] The larger is 7 centimetres long, 21 millimetres wide; the other is 5 centimetres long, 15 millimetres wide.

upon their faces, and they called these stamps *pintaderas*, and this term is still in use. These stamps have been found in the neolithic caves of Liguria[1] and on the hut foundations of Upper Italy.[2] The *pintadera*, Fig. 146, was discovered in the Caverna delle Arene Candide by Don Morelli with another, and the latter has in the crevices of the design some of the red substance, and is for that reason of more importance.[3] The *pintadera*, Fig. 146*a*, was found at the Pulo near Molfetta, and is, like the others, of well-baked clay.[4] A *pintadera* described

FIG. 146*a*.—"PINTADERA" FOUND IN A NEOLITHIC CAVE IN LIGURIA.

FIG. 146*b*.—"PINTADERA" FOUND IN THE PULO, NEAR MOLFETTA.

by Dr. Issel,[5] found in the Caverna Pollera in Liguria, is identical with two *pintaderas* from Troy, which Dr. Schliemann[6] took for scrapers. The *pintaderas* were widely diffused in

[1] Dr. Issel has written on this subject, and was one of the first to collect evidence (A. Issel, *Liguria preistorica*, 1908, p. 121).

[2] *Bullett. paletn. ital.*, iii. 1877, Plate I.

[3] Diameter, 49 millimetres; thickness, 23 millimetres.

[4] Drs. Iatta and Mayer mention this *pintadera* in their *Stazioni preistoriche di Molfetta*, Bari, 1904.

[5] *Op. cit.*, p. 121, Fig. 47.

[6] *Troje*, Figs. 516, 517.

Central Europe, also in the neolithic age. "Among the *pintaderas* of Colombia," writes Dr. Issel, "and of other parts of America, there were some of cylindrical form which were used like a printer's roller." Neither is this type absent from our stations, witness two examples discovered by Don Morelli in the Caverna delle Arene Candide, one of which is reproduced in Fig. 147.

The Babylonian cylinders, which were considered of great importance, are also found in Liguria. This discovery modifies the opinions of archæologists on the influence attributed to the East and to Chaldæa during the period of the second city of Hissarlik, on account of some similar cylinders which were considered to be imitations of those of Babylon; their discovery in deposits of the neolithic age in the caves of Liguria at a distant part of the Mediterranean proves that their origin is much more ancient than was supposed, and we have already seen that the neolithic idols with folded arms also belong to the neolithic civilisation and do not come from Chaldæa.[1]

FIG. 147. — CYLINDRICAL "PINTADERA" FOUND IN A NEOLITHIC CAVE IN LIGURIA.

The fact that the *pintaderas* are common in Lower Austria, Moravia, and Hungary[2] points to the influence of Mediterranean civilisation.

4. "PINTADERAS" FROM CRETE AND EGYPT

The difference between seals and *pintaderas* is that seals are used to make an impression, and the resultant design in the wax

[1] The *pintaderas* of Priesterhügel described by Professor Colini (*Rapporti fra l'Italia ed altri paesi europei; Atti della Società romana di antropologia*) bear a spiraliform design.

[2] *Mittheil d. prähistor. Commis. d. k. Akad. d. Wiss.*, Wien, vol. i. pp. 264, 368, 382. Wosinschy, *Die incrustirte Keramik der Stein- und Bronzezeit*, 1904, Berlin.

or clay is a relief, while the *pintadera* is used to impress a figure by means of colour.

The great *tholos* of Haghia Triada contains rich material for the study of *pintaderas* of the copper age.[1] When this tomb,

FIG. 148.—"PINTADERAS" MADE OF IVORY, FROM THE GREAT "THOLOS" OF HAGHIA TRIADA.

which contained more than a hundred *pintaderas*, was discovered, Dr. Evans observed that a number of the designs are taken from the repertory of the button seals of the Egyptian deposits from the VIth to the XIth Dynasty. They have nearly all a perforation to enable them to be suspended by means of a string ; the hole is

[1] *Memorie Istituto Lombardo*, xxi. 1905, p. 251, Plates X. and XI.

usually only in one part, but some have two holes,[1] as Fig. 148, B.

Figs. 148, 149 represent some *pintaderas* of ivory from the *tholos* of Haghia Triada. They are chiefly of simple geometrical design, but a few exceptions have figures of leaves and animals, knots and arabesques. Professor Halbherr having expressed a doubt as to whether he was correct in describing the collection of objects of ivory, bone, steatite, and terracotta as seals, I undertook to examine the rich collection of seals in the Turin Museum, and found several *pintaderas*, of which I give a reproduction. Fig. 150, A, B, are identical with those of Haghia Triada. The S knot

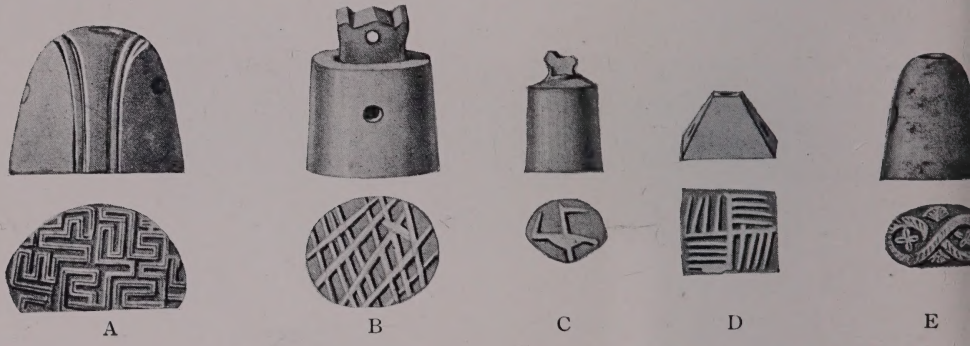


FIG. 149.—"PINTADERAS" OF IVORY, FROM THE GREAT "THOLOS" OF HAGHIA TRIADA.

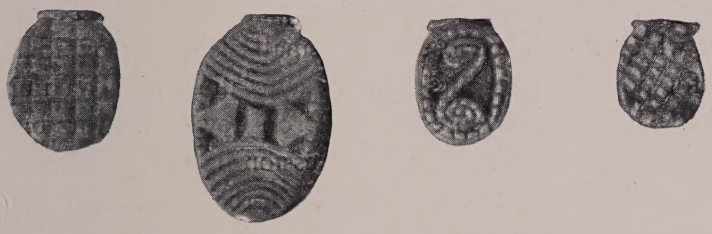
on Fig. 149, E, is found also in the Turin collection (Fig. 150, D). Others, which I do not photograph, represent a maze of lines without order, or a cross with decoration in the corners like that of the *pintaderas* (Figs. 148, D, 149, B). The great size of some *pintaderas* from the great *tholos* convinces us that they were not used as seals. Professor Tsountas found several *pintaderas* in Thessaly in a village which dates back to the end of the neolithic age.[2] The design of one of these resembles those of Haghia Triada and Egypt. A cross divides the field, and there

[1] I published a cubic seal with figures of animals on all six faces in the volume on the Cretan excavations (p. 249, Fig. 117).

[2] Ἐφημερὶς Ἀρχαιολογικη, 1902, Plate I.

are triangles in the corners—that is, there are two lines with a bisecting line, as in Fig. 148, D. Another motive which became very common in the terremare, and which is also found at Hissarlik and in Sicily upon objects of bone, is a circle with a dot or two small concentric circles, which are repeated as a decoration, side by side. This design is also found on the *pintaderas* of Haghia Triada and Egypt.

Professor Schiaparelli does not think it possible to draw from these objects any inference as to their age. It is certain that the designs are not Egyptian in character, and Professor Schiaparelli admits that they may be earlier than the VIth Dynasty. The



A C D B

FIG. 150.—EGYPTIAN "PINTADERAS" IN THE TURIN MUSEUM.

excavations made in Greece by Professor Tsountas prove that similar *pintaderas* were already in use in the neolithic age.

The representation of feline animals on the *pintaderas* (Fig. 148, C) establishes a further connection with Egypt, and puts their date further back; for Dr. Petrie and Mr. Quibell discovered identical animals in the tombs of the neolithic period in Egypt. Besides the resemblance of the *pintaderas* of the great *tholos* with the neolithic designs of Egypt, another reason inclined me to put back the date of this *tholos* before the VIth Dynasty. Dr. Petrie asserts that the polished black hand-made pottery found in the upper strata of the neolithic deposit at Knossos is the same as the pottery which he found in the tombs of the Ist Dynasty at Abydos, and that other vases of the same period and of Egyptian type were found at Knossos. Now we know from my analyses

that there was in these tombs a blade of bronze, and a statue of bronze was made in the VIth Dynasty.

The invention of bronze was so extraordinary an event, and so great was the impression produced in the working of metals, that it is difficult to understand why, instead of carrying Cretan vases to Egypt to be exchanged for other vases, they should not have preferred to carry home the bronze, which offered unexpected advantages both to industry and to arms. There exists here a lacuna which we know not how to fill, for the arms of the great *tholos* are of copper, and if we fix the date as late as the VIth and XIth Dynasties, bronze could hardly be completely absent, otherwise the vases correspond to the later date.

Dr. Pernier found in a sanctuary at Phæstos,[1] in a cavity of a seat which could be closed by a small slab, four ovoidal stones used for pounding colours and a clay sealing with an impressed design. It seems to represent a saffron-flower, with its bulb, and below is a semicircle. The impression is on fine brown clay simply dried, and is twice repeated. I think it is the impression of a *pintadera* with which a round disk was stamped in some colour, leaving blank the design of the saffron-flower and the semicircle which surrounds the lower part like a band. The fact that I have found similar objects near a shrine of the Minoan age at Cannatello[2] confirms the hypothesis that it was the custom to colour the skin for religious functions in the Minoan age.

It is an important point in the study of Mediterranean civilisation that the *pintaderas* are found, from the neolithic period, as I have said before, in the Ligurian caves and hut foundations, and in the terremare of the bronze age, and Dr. Halbherr points out as examples those of the terremare of Montale and of the Cave of Sanguineto.

In the neolithic necropolis which I discovered this year on the Pulo, near Molfetta, I found in a tomb a skeleton, lying on the left side in the contracted position, holding in the palm of the hand a stone knife, and a vase with five small handles near the

[1] *Monumenti Antichi, Lincei*, xiv. p. 487.

[2] Ibid., xviii. p. 648.

edge with vertical apertures for suspension; within the vase was some ferrous ochre for colouring the body red.

Though we do not find the faces painted in the frescoes of Crete and Mycenæ, it cannot be denied that in certain circumstances this custom did exist. One head at Mycenæ, published by Professor Tsountas, has roses painted on the cheeks, forehead, and chin, and it seems to be a reproduction from life. The terracotta masks of a later period, the archaic times of Greece, discovered in Laconia by the British School of Archæology, have marks which indicate painting of the face.

We must therefore admit, with Professor Tsountas and other archæologists, that the fashion of painting the face still existed in the Mycenæan period. Upon a Greek vase in the Museum of Monaco is a representation of two women, with sword in hand, who are looking back as they run away. On their hands near the wrist is painted the figure of an animal, while just below the knee are figures of horned animals, besides zigzag lines on their necks and waved lines on the chin.[1]

5. THE SWASTIKA

Upon several *pintaderas* from the *tholos* of Haghia Triada is a representation of the fylfot cross or gammadion as shown on Fig. 149, C, D. "A religious sign which comes from India," say the old books, and many writers have relied on this erroneous idea to support the theory that our civilisation comes from the Far East. We now see that the swastika appears in the Mediterranean before we find it in the East. The swastika appears too on the gems of Knossos, but these examples of Dr. Halbherr's are the most ancient now known.

The swastika may have existed in Italy from the neolithic period if the piece of pottery discovered by Professor Stasi in the Cave of Zinzulusa, near Castro, at the extreme point of Italy, near Cape Leuca, is of the neolithic period (Fig. 151).[2] Professor

[1] P. Wolters, *Hermes*, vol. xxxviii. 1903, p. 268.

[2] I have to thank Professor Stasi for permission to publish this rare object.

Halbherr tells me that the sign within which the swastika is enclosed resembles the Cipriot "pa," which is here doubled. As I did not actually excavate it myself I cannot say for certain that this piece of pottery from the Cave of Zinzulusa really belongs to the neolithic period.

Dr. Reinach[1] notes that the swastika is not found in Assyria, Phœnicia, or Egypt; this was a good reason for doubting that the

FIG. 151.—POTTERY WITH THE MARK OF THE SWASTIKA, DISCOVERED IN THE NEOLITHIC CAVE OF ZINZULUSA BY PROFESSOR STASI.

swastika could have originally come from the Far East, but it has now been found near Susa by Drs. Gautier and Lampré.[2]

It has also been supposed that the swastika only appears on either side of the Alps in the early iron age,[3] but recent excavations have shown that it had reached the continent of Europe at the close of the neolithic age; the fact that it has been found in great numbers in France,[4] and specially in the lake villages, has

[1] S. Reinach, *Chroniques d'Orient*, 2e série, 1896, p. 529.
[2] *Fouilles de Moupian, Mémoires de la Délégation en Perse*, vol. viii. p. 59.
[3] *Bullettino paletn. ital.*, iii. 1877, p. 43.
[4] Bertrand, "Nos Origines," *La Réligion des Gaulois*, pp. 140, 184.

pointed out another path by which Aegan civilisation may have reached the North of Europe.

6. RED

In the time of Herodotus a people of Libya used to dye their whole body with vermilion,[1] and the Arabs under Xerxes had the same custom.[2] This fashion has been kept up to the present day in the interior of Africa, where the women grind the wood of *Pterocarpus tinctorius*, and the red powder resulting from it mixed with water and palm oil is used for painting the body either in stripes or all over. In other parts of Africa ochre is used by the negroes.[3]

Here comes in the psychological problem of red, and why red should be the colour preferred by primitive peoples. I believe it is owing to the excitement produced by red colour upon the nervous system. Other colours, such as yellow and black, are more easily obtained at a less cost than red, but children and savages prefer red, and we know not why this colour, like certain sounds, produces a pleasing sensation. Perhaps with the advance of civilisation our nervous system is becoming too excitable to receive an agreeable impression from red, and for this reason the palette of our modern painters holds colours of less intensity, tending to blue and grey.

From Egypt, where Amelinau[4] found pots of red ochre in the tombs of Abydos dating from the Ist Dynasty, to France of the reindeer period, the peoples of Europe and Africa have used a ferruginous substance for colouring the body red.

Professor Orsi has recently described the pots full of bright red colouring matter found in the neolithic tombs of Terranova in Sicily.[5] In Upper Italy, too, it was the custom in the neolithic age and early copper age to colour the body red, for ferrous

[1] *History*, iv. [2] Ibid., vii.

[3] Stanley, *Travels in Search of Livingstone*.

[4] Amelinau, *Religion Egyptienne*, 1908, p. 153.

[5] Orsi, "Sepolcri Protosiculi," *Bullett. paletn. ital.*, xxxiv. 1908, p. 119, Plate IV. Fig. 6.

ochre was found in vases in the Caverna delle Arene Candide, and in the tombs of Remedello.[1] From the excavations at Cannatello[2] I had several pieces of ochre; on being pressed between the fingers it was reduced to an impalpable powder, so fine and adherent that when I rubbed some on the back of my hand it remained there all day.

7. COLOURED SKELETONS

More complex is the problem of the skeletons coloured red. One of the skulls, well known for this coloration, and which has been described by Professor Pigorini, was found near Sgurgola in the province of Rome.[3] In a tomb near Brünn,[4] in Austria, was a skeleton coloured red which belonged to the earliest period of the stone age; and other skeletons dyed with ferrous ochre have been dug up in various parts of Germany and France.[5] The most ancient coloured skeletons of Italy are those of the neolithic period in Liguria.[6]

We have seen (Fig. 76) that stone and copper weapons were coloured in red for funeral use. Two arrows near the skeleton at Sgurgola were coloured red also, and the body had been buried in the characteristic crouching position.

As my personal experience in this question is limited to the excavations of the Pulo and Cannatello, which I have already described, I will not stop to consider the subject further. Skeletons coloured in red with the legs bent up against the body are frequent in Russia. In the last International Congress of History, held in Rome, Professor G. Kulakovski[7] made a communication upon coloured skeletons. In the tumuli in which

[1] Colini, *Bullett. paletn. ital.*, 1908, p. 8, xxviii. p. 6.

[2] *Monumenti Antichi, Lincei*, xviii.

[3] *Bullett. paletn. ital.*, 1880, vi. Colini, Ibid., xxiv. Plate XVI.

[4] Much, *Die Trugspiegelung orientalischer Kultur*, p. 134.

[5] Cartailhac, *La France préhistorique*, p. 91.

[6] Skulls with traces of red colouring matter were found at Taranto.—Q. Quagliati, "Tombe neolitiche in Taranto," *Bull. paletn. ital.*, xxxii. 1906.

[7] Kulakovski, *Sur la question des Squelettes coloriés*, 1904, iv. p. 673.

he had discovered coloured skeletons lance heads of bronze were found. The red colouring matter had been thrown upon the bodies in such abundance that the whole skeleton was covered by it, and lumps of ochre as big as a pigeon's egg were found.

Contrary to the opinion of Professor Virchow,[1] who admits double interment and the posthumous coloration of the skeletons found in Germany, Professor Kulakovski believes that the red colouring matter was thrown upon the corpses. He says that he found at Balbec, in 1896, a tomb made of four great slabs within a tumulus. On raising the fifth slab, which served as a cover, he saw two skeletons in the contracted position, and above them a large streak of red colouring matter which passed in a zigzag from one body to the other. Where the colour passed from one to the other it was also visible upon the pebbles which formed the floor of the tomb. Every small bone of the phalanges of the hands and feet was so exactly in place in these two skeletons lying on their sides, says Kulakovski, that no anatomist could have put them so correctly in position.

This explanation seems reasonable, and it is probable that the ochre thrown upon the corpses and above the clothes might reach the bones when the organic tissues were destroyed by putrefaction. This does not, however, exclude the direct coloration of the skeleton in case of double interment, as in the case of the skull from Sgurgola, in the Museum at Rome. In Spain skeletons were found coloured with red and black [2] in tombs belonging to the early bronze age, containing numerous stone palettes like those from Egypt which were used for pounding the colouring substances upon. The explanation given by the Russian, Professor Kulakovski, will not hold good for the skull from Aryar described by the brothers Siret,[3] which has a band of cinnabar with straight edges, painted across the forehead like a diadem.

[1] *Zeitschrift für Ethnologie*, 1898, p. 71.
[2] Déchelette, *Révue Archéologique*, xii. 1908, p. 229.
[3] H. L. Siret, *Les premiers âges du Métal*, p. 157, Plate XX.

CHAPTER XVII

PRE-HOMERIC NAVIGATION

I. NEOLITHIC SHIPS

MANY museums, both in Italy and abroad, contain specimens of prehistoric boats from the palafitte and peat bogs similar to the Indian pirogues,[1] but of the neolithic period we possess only drawings and small models, like that of Fig. 152 in the Egyptian Museum at Turin. It is yellow and slightly baked, and shows white granules in the fracture. The surface is rough with traces of black from the smoke of the fire. In the boat is a standing figure with a very large beak-shaped nose. It stands within a cabin which had a window in front, of this only one upright, on the right of the figure, is intact. The back of the cabin behind the figure is preserved. There is a green line round the outside edge of the boat; near the cabin this line turns at a right angle and passes round the cabin. The form of the bows and of the stern show that boat-building had at that time attained remarkable development. It is well hollowed out on the inside, and terminates at each end with a sort of short deck, having a square hole, into which the mast for the sail or the staff of a flag would possibly be fixed. The figure in the boat holds the left arm raised and the right falls at his side. The legs are covered by a long petticoat. Very interesting is the form of the poop, which resembles that of a bronze boat

[1] In the Turin Museum are two of these boats found in the peat bog of Mercurago.

found in Crete, in the sanctuary of Zeus on Mount Ida.[1] The distance of time between the two is so great that no conclusions can be drawn.

Fig. 153 shows the decoration of a neolithic vase found at Naqada in Upper Egypt. Other vases from Abydos[2] have the same decoration, one was shown on Fig. 106. Here also the boat has many oars, and two cabins amidships. The one on the right bears an ensign, which seems to consist of two pairs of horns. Sometimes there is a trident, or a fish, or a bow and arrow or some animal. At the prow a tuft of palm, and below is the usual spread sail.

Fig. 107[3] contains some details which show the Libyan origin of the people who made the drawing. Upon a mast to the right

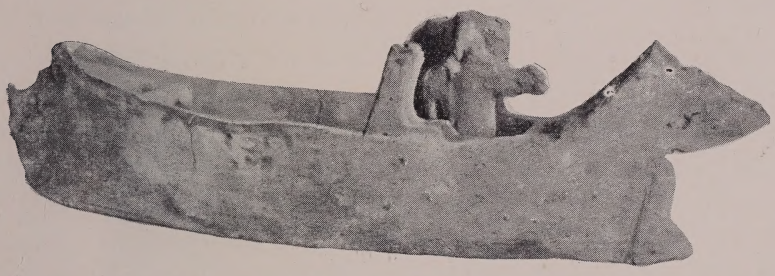


FIG. 152.—NEOLITHIC VESSEL OF TERRACOTTA, NOW IN THE EGYPTIAN MUSEUM OF TURIN.

of the two cabins there is in each of the two boats the figure of an elephant above a sort of flag. This was probably a conventional sign to indicate the identity of the boat. Above this are figures of ostriches. As neither elephants nor ostriches are indigenous to Egypt, we must admit that the people who made these drawings came from the interior of Africa. This piece of evidence, as well as that already given, and the anthropological evidence confirms the theory of the African origin and

[1] Orsi, *Scavi e trovamenti dell' antro di Zeus: Museo italiano del Comparetti*, vol. ii. p. 730.

[2] Petrie and Quibell, *Naqada and Ballas*, Plate XXXIV. Fig. 45.

[3] Ibid., Plate LXVII. Fig. 14.

the diffusion of the Mediterranean race. At the prow stands a conical recipient which may have held a little water in which palm leaves may have stood. At the stern are three oars, with an extension which served as a rudder.

The great number of the oars excites surprise, and may be due to exaggeration or to the ignorance of the designer. The oars are often absent in the space between the cabins, as if this were the point from which orders were given. Such free space is seen in Figs. 106 and 107, in which an awning is stretched between the cabins. The black triangles seen on the upper part in Fig. 107 represent a chain of mountains. It is a motive which often appears on these vases and on others from the Aegean and from Crete, and Dr. Evans[1] considers it to be a symbol of mountains. This certainly represents an exotic landscape, for no such mountain range exists in Egypt. Petrie and Quibell, who are authorities of repute on the question of the primitive monuments of Egypt, consider that these vessels are of the Mediterranean rather than of Egypt, and believe the vases to be importations. If so, they must have come by way of Libya.

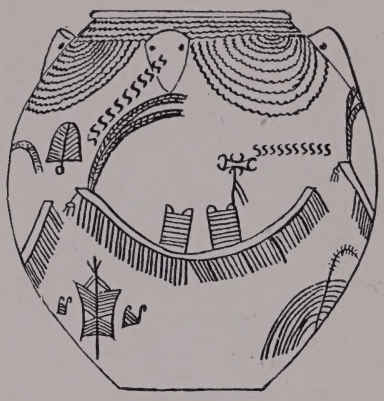


FIG. 153.—DECORATION OF AN EGYPTIAN VASE OF THE NEOLITHIC AGE.

Some rock carvings in Upper Egypt help us to understand the arrangement of sails and oars in the vessels of the first dynasties. The drawing (Fig. 154) removes all doubt as to the great number of the oars.[2] Besides, Homer had already said in the Odyssey—

"Shapen oars which serve as wings to ships."[3]

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[1] Evans, *Cretan Pictographs*, p. 313.

[2] De Morgan, *op. cit.*, vol. i. 1896, p. 164.

[3] "*οὐδ' εὐήρε' ἐρετμά, τά τε πτερὰ νηυσὶ πέλονται.*"—Od. xi. 125.

And later on the oars were the chief force in the battles of Salamis and Actium, and also of the Venetian triremes. In the rock drawings the sails and the shape of the rudder are well

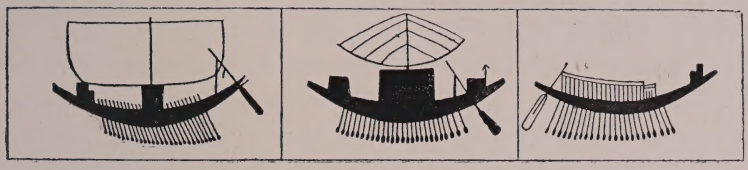


FIG. 154.—NEOLITHIC SHIPS, CARVED ON THE ROCKS IN UPPER EGYPT.

shown. On Lake Maggiore and other lakes of North Italy the large cargo boats still have their rudder of the same shape as that of these prehistoric boats from Egypt.

2. VOYAGES IN THE NEOLITHIC AGE

The excavations made by Professor Issel and by Don Morelli in the caves of Liguria give us useful information on the extension of commerce in the neolithic period. An exotic shell, *Mitra oleacea*, found in the Caverna delle Arene Candide,[1] is of North African origin, and of another, *Purpura hæmastoma*, Don Morelli found a hundred and twelve specimens of varying size, many of which had had the apex removed by the hand of man. All these shells present evident signs of having been worn by the action of water. This mollusc has never been found in Italy, but is very common along the West African shore. It was found also by Don Morelli in the Cave of Pollera. This proves that sailors returning from Africa brought these shells with them, and the fact that they are damaged by water agrees with what I before supposed, which is that they were picked up on the shore and brought home as a record of, or a votive offering for, escape from the dangers of the sea. On the hut foundations near Reggio Emilia were found the shells from Eastern seas (*Meleagrina Margaritifera*), recorded by Colini.[2]

[1] Issel, "Del ritrovamento di una conchiglia esotica nella caverna delle Arene Candide," *Bull. paletn. ital.*, 1887, p. 173.

[2] *Atti della Società romana d'Antropologia*, vol. x. 1904.

Mythology preserves the memory of pre-Homeric voyages beyond the Mediterranean. The legend of Herakles records that the national hero of the Hellenes went to Crete and carried off alive to Mycenæ the furious bull which Minos would not sacrifice. His voyage along the coast of Libya and the story that he set up the columns in the Straits of Gibraltar as a memorial of his passage through the Straits, now appear to us in a new light. The island of Erythea, located in the ocean to the farthest west, makes one think of the Cassiterides Islands, and this labour of Herakles seems to us far more worthy of admiration than a voyage on the ocean in the golden ship of the sun with the object of killing a dog with two heads and carrying off the cattle of Geryon.[1] On his return he followed the other prehistoric road, that by which the tin trade was carried on, and came to Liguria and into Italy. These details, together with the Cretan name *Herakles*, the original appellation given to Hercules, suggest another explanation. The voyage of Herakles on the Atlantic and across Europe may have been an enterprise connected with the trade in tin.

Maritime relations in the prehistoric age gain great importance with regard to the knowledge of tin, for there is no archæological evidence of any commerce between India and the West.[2]

3. MYCENÆAN VASES IN ITALY

Among all the wall paintings discovered by Dr. Evans at Knossos the one which produced the strongest impression on me was the picture of a youth carrying a great conical vase. It was the first time during the Cretan excavations that the life-sized portrait of a person of Minoan times had come to light in a state of perfect preservation. The astonished labourers knelt down and prayed before the brilliantly coloured painting, looking on it as a miracle that they should see appearing from

[1] Apollodorus, 4, 5, 10.

[2] E. Speck, *Handelsgeschichte des Altertums*, 1900, vol. i. p. 193.

the depths of the earth upon a smooth white wall the image of a saint. He is a handsome youth with curly black hair and regular profile. Handsomely dressed, his clothing fits closely at the waist and is embroidered with a design of small flowers, while below the projecting belt he wears an embroidered loin-cloth. Near the left shoulder is a bracelet passing twice round the arm, and at the wrist is another bracelet, with an oval engraved stone in the middle; this is the galopetra which was used as a seal. These stones are found wherever the Minoan navigators passed.

FIG. 155.—CORNELIAN GALOPETRA, MUSEUM OF BARI.

In the Museum at Bari I found one of these engraved stones (Fig. 155), on which a lion is attacking a gazelle. The stone is a cornelian, similar to another which Dr. Evans found in the prehistoric tombs at Knossos. Art was approaching its decadence, as we see from the conventionalised forms of the animal and by the profile of the heads. The lion attacking a gazelle is a common subject found reproduced in many similar specimens from Crete.

At Bari I found in the Museum another coincidence which impressed me; it is an Egyptian scarab identical with one found by Dr. Evans at Knossos,[1] and both are probably of the XVIIIth Dynasty. We must not attribute too great importance to these small and easily carried objects, but there are in Italy other and safer documents testifying to the voyages of Minoan peoples in the Adriatic and Tyrrhene Seas.

Rather higher up the Adriatic, at Manfredonia, I made some excavations[2] in a place called *Coppa Nevigata*, and in the upper strata of a small hill at the depth of $1\frac{1}{2}$ metres I found vases of

[1] A. Evans, *The Prehistoric Tombs of Knossos*, p. 88, Fig. 100.

[2] "La Stazione di Coppa Nevigata," *Monumenti Antichi*, xix. 1909.

Mycenæan appearance of which two fragments are shown on Fig. 156.

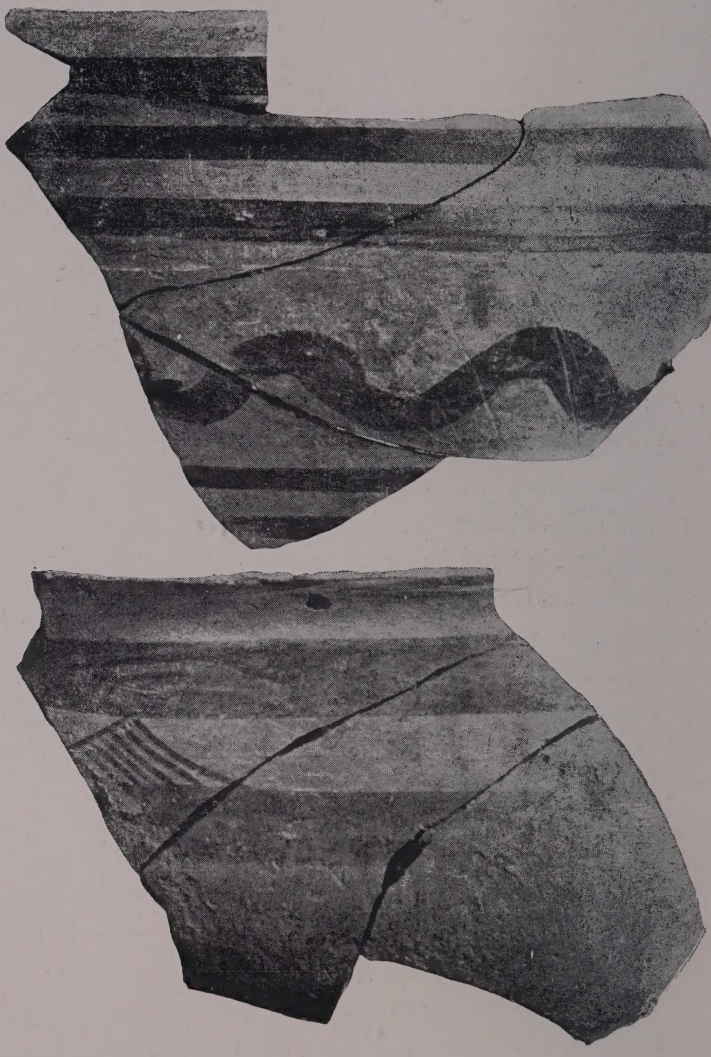


FIG. 156.—POTTERY FROM COPPA NEVIGATA, NEAR MANFREDONIA.

A stele at Pesaro, described by Odorici,[1] bears three boats carved between Mycenæan spirals; the skeletons in the tombs

[1] Odorici, *Di una pietra figurata a forma di stela discoperta a Pesaro*, Perugia, 1873, reprinted by Undset, *Zeitschrift für Ethnologie*, 1883.

were lying on one side with the knees bent up.[1] These are the tombs of the navigators of the Aegean, who in times a little later than the Mycenæan period had a station here, whence they carried on trade with Etruria and the valley of the Po.

FIG. 157.—MINOAN VASE ("PALACE STYLE OF KNOSSOS"), FOUND AT MATRENSA, IN SICILY.

The richest and most undoubted collection of Minoan and Mycenæan vases is that made by Professor Orsi, and I reproduce

[1] It is a flat slab of sandstone 145 centimetres wide, 90 centimetres high, 14 centimetres thick. The Prehistoric Museum of Rome has lately acquired from the district of Fano two other stelai identical with that from Novilara. They also bear a carving of a boat. Other fragments with the same decoration of Mycenæan spirals were found near Fano.

some vases from the Museum at Syracuse to prove that Sicily had in Minoan times relations with the Island of Crete. The vase (Fig. 157), found at Milocca, near Matrensa, is identical with those of the palace style discovered by Dr. Evans at Knossos. A goblet of later Mycenæan character is shown on Fig. 158, 2, found at Cozzo Pantano ; the jug (No. 1) and the small urn (No. 3) were found at Thapsos, and also belong to the end of the Mycenæan period. The vase (Fig. 159) discovered at Girgenti

1 2 3

FIG. 158.—MYCENÆAN VASES. 1 AND 3 FROM THAPSOS, 2 FROM COZZO PANTANO, SICILY.

is of yellow clay like the other vases ; but if the red and brown decoration is of Mycenæan character, the style is that of the sub-Mycenæan of Curtes, and of other Cretan necropoles of the transition period. At Taranto Mycenæan pottery is abundant, and the examples shown should suffice to demonstrate the connection and the voyages made by the Aegean sailors in the Adriatic and in Sicilian waters. I will refer later in Chapters XXII. and XXIV. to their voyages in the Tyrrhene Sea. Historians had already told much that is now confirmed by archæology, and

the statements of Herodotus and Strabo [1] are found to be exact. The progress of archæology in Italy is little known ; and the great Mommsen to his death in 1903 believed that there was no trace of a stone age in Italy.[2] Relying too much on Homer, supreme in knowledge of the past as he was, he dared to assert

FIG. 159.—MYCENÆAN VASE FROM GIRGENTI.

that, at the time of the Homeric poems, there was in Grecian lands, then first entering into relation with the West, no definite knowledge (*zuverlässige Kunde*) of Sicily and Italy.[3]

[1] Strabo, ch. iii. 2, 5.
[2] T. Mommsen, *Römische Geschichte*, 9th ed. vol. i. p. 9.
[3] *Op. cit.*, p. 129.

4. MINOAN VESSELS

The Minoan seals made of engraved stones found in Crete are valuable material, though till now made little use of, towards

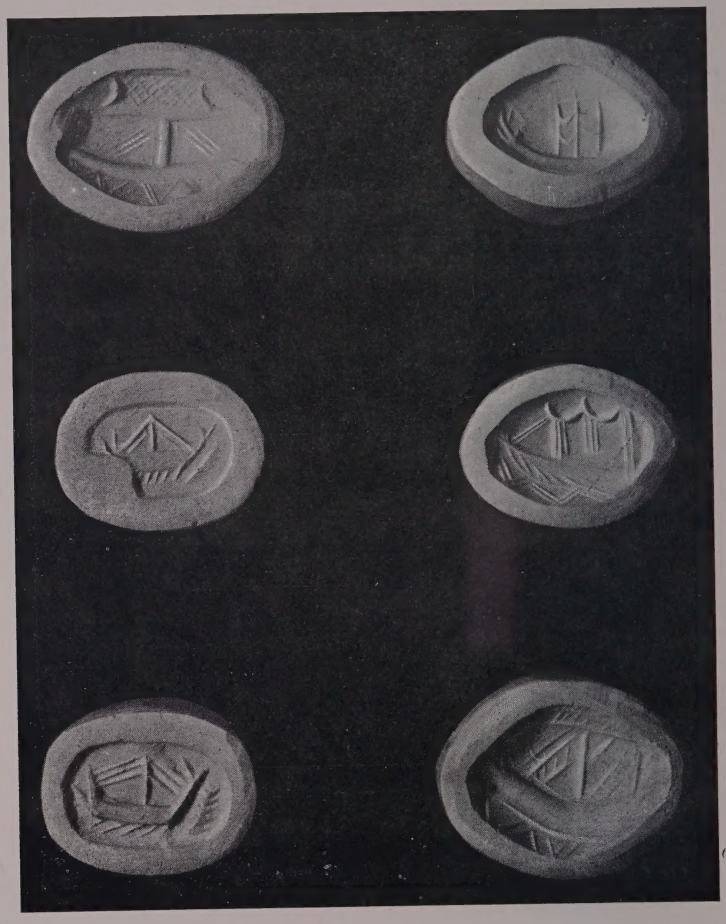


FIG. 160.—MINOAN SHIPS INCISED ON CRETAN SEALS.

the history of navigation. Six impressions from galopetre (Fig. 160) show the form of the pre-Homeric ships. No. 1, found at Palaikastro, in the excavations of the British School,

represents a one-masted vessel with the shrouds made of three ropes which pass from the extreme ends of the vessel; the prow, higher than the stern, divides at the point into a V shape. The stern, too, is cleft into a swallow-tail. We shall see that this form is common to all primitive vessels. A similar form is found in Egypt in the wall paintings of Medinet Habou, which represent the invasion of the confederate fleets.

In the vessel No. 2 we see the termination of the prow, and here are only two ropes fastened to the mast in the centre. In both cases the artist has intended to show the oars, of which there are five in the first vessel. The points in the vessel near each oar are perhaps the thole-pins on the gunwale of the boat upon which the byles are fixed to keep the oars in place. In both these seals a branch is fixed on the front of the vessels, probably to indicate that the boat is about to touch land. The stone No. 3 was found at Mirabello, and on this the square sail is distinctly indicated. The structure of the vessel and rigging appears much more complex in No. 4. In the first place there are two masts in this vessel, and the ropes are interlaced so as to form, as it were, ladders differing little from those which we see rising from the gunwale of our ships to the rigging. Above the two masts the sails are spread horizontally. The prow is formed like a trident, having the two external prongs bent outward at an acute angle; this is not easy to see in the illustration, because of the shadow in the hollow. In No. 5 the same trident-shaped prow is repeated with the two external prongs bent at an acute angle. Here the three masts are distinct with the stay sails between. The shrouds are arranged so that the two ropes belonging to the first mast pass to the stern. The arrangement of the braced yards is still better shown in No. 6, where three masts are held together by a yard braced across. The furled sails hang in the form of a half-moon. The stern is of the same form as the others. The three masts explain how these ships were sailed close to the wind by tacking. Even with a following wind the vessel would make more way if

steered obliquely so that the wind would fill more than one sail.[1]

The Phœnicians adopted the form of the Cretan vessels, which had the stern high and curved ;[2] the mast, rigging, and sails are identical. The fact that all the nautical terms used by Homer are Greek words, and that none of them are derived from the Phœnician language, gives indirect proof that the Phœnicians exercised no influence on Mediterranean navigation.

On the painted sarcophagus at Haghia Triada, alluded to in Chapter XII., a priest is carrying a boat (Fig. 161). Dr. Paribene believes this to be a sacred image for the transport of souls, like those of Egypt. Note 1, below, shows how few are the boats found in Crete, and this appears more plainly in the excavations of the cemetery of Knossos by Dr. Evans ; we cannot therefore attribute to Minoan religion the funeral custom of placing several boats beside the corpse for his use in the voyage to another world. I believe that the Minoan race only put a boat in the tombs of real sailors, just as they placed by the body of a carpenter his chisel and saw. This drawing represents the funeral of a sailor, and for the

FIG. 161.—FIGURE OF A PRIEST CARRYING A BOAT. PAINTED SARCOPHAGUS OF HAGHIA TRIADA.

[1] The most ancient model of a Cretan vessel, found at Palaikastro, is of terracotta and belongs to the earliest Minoan period (*Annual of the British School*, x. p. 197). At Haghia Triada the Italian Mission found two boats, one of terracotta, the other alabaster, contemporary with the vessel in the sanctuary at Knossos described by Dr. Evans (*Temple Repository*, Report 36, p. 58). Dr. Evans also found an ivory boat in the cemetery of Knossos (Evans, *Prehistoric Tombs of Knossos*, p. 27). We see in this boat some interesting details, such as the hatch, similar to that in our modern ships, for keeping the water from getting into the hold.

[2] Cesnola, *Cyprus*, London, 1877, xlv.

FIG. 162.—BOATS OF KALIMNIOTE SPONGE-FISHERS IN THE PORT OF CANDIA.

passage of his soul there are on the sides of the sarcophagus two priestesses, who drive the car drawn by winged griffins.

The modern vessels of the Cretan fishermen, and specially those of the fishers for sponges from the Isle of Kalimnos, differ little from the ships of antiquity, and Figs. 162 and 163 show photographs of two fishing-boats taken in the Port of Candia. The lowered masts and a long pole are seen in the boat without sails, and in the other also there is a spare mast. At Candia I saw the fishermen sail up and down the Mediterranean, and here I made acquaintance with some fishermen who had crossed from Italy in their small vessels. I wanted to go out to sea for a sail in one of these little skiffs, and I sailed round the Isle of Dia to have the pleasure of feeling what it was like to travel in Minoan times on the Mediterranean, for I thought there was little difference in the vessels. At Molfetta I often found myself in the midst of a flotilla of fishing craft belonging to fishermen who crossed the Mediterranean in all directions in their small boats. The reader will forgive me if, in the hope of carrying him back to the days when there were no twin-screw steamers built of steel, I have spent too much time in reproducing by photography these surviving records of ancient navigation. No religion preserved a stronger veneration for the sea than the Minoan cult. The storms and long voyages only urged on the Cretans, who became proverbial as the most famous of navigators.

The fragments which I have collected are a testimony to the bravery of the race who founded Mediterranean civilisation. From the Aegean came the first stirrings of the life that is now about to blossom again, and the ferment of progress was developed where these ships came to land.

The Indo-Germans, as Schrader [1] says, possessed no nautical terminology ; they knew neither sail nor anchor, neither rudder nor yard.

The recent progress of archæology has cut off for ever the old tradition of the Phœnicians, who were always believed to

[1] Schrader, *Reallexicon der Indogermanischen Altertumskunde.*

FIG. 163.—BOAT OF KALIMNIOTE SPONGE-FISHERS IN THE PORT OF CANDIA.

have been the first navigators of the Mediterranean. The Phœnicians were tradesmen, and their commerce has been continued in the same way by the modern Semites. The real masters of the sea who dispersed the pirates and brought about communication between the peoples of the Mediterranean were the Cretans, and they owe this advantage to the geographical position of their island as a half-way house between three quarters of the world. What the Phœnicians lose the Minoans gain, and there are some who believe that the Odyssey was sung first of all in the Island of Crete.

Helbig humorously says that the war waged against the Phœnicians during the last few years is part of the anti-Semitic struggle. It is, however, an undeniable fact that they have left no trace on the language of the sea. The Phœnician nation presents this strange anomaly, that in spite of the great renown of the Phœnicians, in spite of the riches accumulated by their industry, they possessed no art or literature of their own, and their history was written in later days by men of other nations.

5. NAVIGATION IN THE HOMERIC POEMS

The first and greatest epic of the Mediterranean was ended when the Homeric singers began to celebrate the deeds of the Trojan war and the adventures of Odysseus. The Aegean race had ceased to be a nation of bold navigators. The glory of Minos and the thalassocracy of the Cretans had set for ever. On the shield of Achilles, says T. Day Seymour,[1] Vulcan represented all the scenes of life but no record of the sea.

The Homeric ships were for transport and for cruising, not for battle. Amidships was the gangway, where the sailors lowered the yards with the sails, at the sides were the benches for the rowers. They are much curved, and the extremities rise up like horns, so say the adjectives by which they were designated. They were so low that the men could throw sheep on board into the hold ; and there was no closed space to sleep

[1] *Life in the Homeric Age*, p. 305.

or to cook in. The valuable merchandise lay exposed to the eye of the public and of the crew. When the wife of Alkinoos presented Odysseus with a chest which held the gifts of the Pheakians, she tells him to make sure that it is closed and to have it better tied up lest the galley slaves open it while he sleeps. The sails were square and as wide as the ship ; but when a sail is alluded to it is generally in the plural—

"and hauled up the white sails with twisted ropes of oxhide." [1]

With Telemachus were twenty rowers ; he starts at midnight because at that hour the land wind begins to blow towards the sea, while all day till about ten o'clock the contrary wind would blow from the sea towards the land—

"so all night long and through the dawn the ship cleft her way." [2]

The word slave only appears once in the Homeric poems ; and for males no slavery existed : this was one of the glories of the primitive Hellenic civilisation which the Greek philosophers could not admire. All who were on board had to row, for Elpenor desires that on his tomb an oar should be set up—

"and on the topmost mound we set the shapen oar." [3]

6. SPEED OF PREHISTORIC NAVIGATION

We find in the Odyssey the method of trading in Homeric times. When the Phœnicians arrived at a port they sounded a trumpet, and exchanges were made on one side or another so slowly that they often waited a year !

Herodotus says : [4] "The Phœnicians . . . landed . . . at Argos . . . they exposed their merchandise and traded with the natives

[1] "*κατὰ δὲ προτόνοισιν ἔδησαν, ἕλκον δ' ἱστία λευκὰ ἐϋστρέπτοισι βοεῦσιν.*"—Od. ii. 425–6.

[2] "*παννυχίη μέν ῥ' ἥ γε καὶ ἠῶ πεῖρε κέλευθον.*"—Od. ii. 434.

[3] "*πήξαμεν ἀκροτάτῳ τύμβῳ εὐῆρες ἐρετμόν.*"—Od. xii. 15.

[4] Herod., i. 1–2.

for five or six days; at the end of which time, when almost everything was sold, there came down to the beach a number of women, and among them a daughter of the King Io, the child of Inachus. The women were standing by the stern of the ship intent upon their purchases when the Phœnicians . . . rushed upon them, the greater part made their escape, but some were seized and carried off. Io herself was among the captives. The Phœnicians put the women on board their vessel and set sail for Egypt. At a later period certain Greeks, who would probably be Cretans, made a landing at Tyre on the Phœnician coast and bore off the King's daughter, Europé. In this they only retaliated."

Some think that this was the Europa who gave her name to our continent, for according to their own account it was the Phœnicians who first explored the coasts of Europe; but we have seen that modern archæology has taken this glory from the Phœnicians. The name of Europe is first found in the songs of Homer to indicate the north of Greece. However this may be, the mother of Minos was called Europa, and the name of our continent came from Crete.

When the wind was favourable, the Minoan ships could, on account of their build, sail the Mediterranean with a swiftness equal to that of ordinary modern steamers. According to the Odyssey,[1] it took five days to sail from Crete to Egypt at a rate of 140 kilometres a day; but as they did not make the crossing of 700 kilometres in a straight line, but first touched Africa and then sailed along the coast, the voyage of Odysseus must have been made at a swifter rate than 140 kilometres in the twenty-four hours. On reckoning up the itinerary according to the Homeric poems we get an average rate of 9 kilometres an hour.[2]

[1] Odyssey xiv., 257: "πέμπταῖοι δ' Αἴγυπτον ἐϋρρείτην ἱκόμεσθα."

[2] V. Bérard, *Les Phéniciens et l'Odyssée*, 1902, p. 87. The ships of the time of Herodotus (iv. 86) were equally swift. He quotes as an average rate 124 kilometres by day and 106 by night; that is, about 10 kilometres an hour for the whole twenty-four hours.

Plutarch relates that Cato, though he was called the Roman Demosthenes, did not trust to his own eloquence when on returning from Libya he wished to convince the Senate that the destruction of Carthage was necessary. At the close of his speech he drew forth some figs from the folds of his toga, and showed them, exclaiming: "These come from Africa, and only a three days' journey separates us from Carthage."

CHAPTER XVIII

PREHISTORIC COPPER MINES IN SINAI AND CRETE

I. THE MINES OF MOUNT SINAI

THE sculptured rocks of Mount Sinai record the history of metallurgy.[1] One scene, containing five figures larger than life, show a king striking a kneeling Bedouin over the head with his mace. These carvings of the Ist Dynasty are excellent in design and execution ; the anatomy of the muscles is exactly copied from life. Dr. Petrie observes that the face of the Bedouin nearly resembles that of the present chief of the district, so little altered is the local type in spite of the seven thousand years (according to Dr. Petrie's chronology) which separate them.

Other inscriptions of the IIIrd Dynasty (4950 B.C.) speak of the mining industry, and the portrait of one of the kings (also represented in the act of striking down a Bedouin chief) reproduces a purely Ethiopian type, and this resemblance may not be without interest for those who would make the Pharaohs come from Asia.

It has been calculated that Moses led the people of Israel to Mount Sinai about 1300 B.C. A century later the mining operations of Mount Sinai were interrupted permanently because the copper, never plentiful, was soon exhausted. Turquoises were found in the prehistoric tombs of Egypt. The fact that Mount Sinai was known by the name of the "Mistress of

[1] Flinders Petrie, *Researches in Sinai*, London, 1906, p. 42.

Turquoises" gives us reason to think that it was the fashion of wearing these stones for ornament which brought the Egyptians to Mount Sinai in the neolithic age, and that they only discovered copper there later on.

The recent excavations in Asia have added most important pages to archæology, but little to the history of metals; and it seems as if by raising the veil from the history of ages till now unknown, the original centre of metallurgy has been moved further to the West, the mines which Dr. Hazzidaki and I found at Chrysocamino in Crete proving to have been worked from the Early Minoan age, contemporaneously with those of Mount Sinai.

M. de Morgan,[1] while studying the geology of Mount Sinai, which is rich in copper and iron, found in the most ancient of the subterranean passages both flint knives and stone implements which had been used for digging in the ground.

The writings of Dr. Berthelot[2] inform us as to the primitive methods of extracting copper, and will be of use in my account of other mines, for the galleries are still in existence, with fragments of the crucibles and the scoriæ. Upon Mount Sinai the ground is poor in minerals, containing only what the infiltration of water beneath the ground can have brought to the surface from the deep strata of pyrites which cannot be reached by the mining operations of man. Native copper, that is, copper in the pure metallic state, does not exist, and therefore it must have been the more difficult to extract this copper.

It was probably after the burning of some forest that copper and silver were found prepared by fire, and this method of extraction remained always in use. The Egyptians used wood or coal as reducers, and made use of siliceous, calcareous, or ferruginous material in smelting. The scoriæ are brown or black, partially vitrified and of ferruginous appearance. The crucibles are all broken, and consist of quartzose sand bound

[1] De Morgan, *Recherches sur les Origines de l'Egypte*, 1896, p. 218.

[2] *Histoire des Sciences* (*Comptes rendus de l'Acad. des Sciences*, 19 août, 1896).

with clay partly vitrified by the high temperature to which they have been subjected.

Dr. Berthelot observes that however poor the deposits of Mount Sinai may have been, copper was in those days so precious a metal that neither expense nor men would be considered.

Division of labour is an economic law which appears at the dawn of civilisation, and the tendency to speak ill of the bureaucracy is a modern thing, originated by a levelling and domineering democracy. If we study the states of antiquity (especially with Mommsen that of Rome) we see what care and ability in administration are necessary for the formation of a solid and powerful organisation. The specialisation of service reached under the early Egyptian dynasties its highest development. We learn the details from Dr. Flinders Petrie's study of the subject, written from the experience of fifteen expeditions to Mount Sinai.[1] As it was a long journey, and had to be made partly by sea, it was necessary to have physicians, interpreters, inspectors, clerks, soldiers, and means of transport. In one expedition a train of five hundred asses is mentioned. There were not less than twenty-five different grades of superior officials. One inscription of the VIth Dynasty says that all these employés were the eyes and ears of the King.

There were eleven different grades of inspectors for the superintendence of the labourers in the special work of the mines, and there were eight distinct classes of skilled workmen. Egypt never kept the mines of Mount Sinai completely in her power by a permanent garrison, but made costly expeditions there from time to time. One expedition under Rameses IV. consisted of eight thousand men. We can imagine the difficulty of this journey through the desert without the means of providing for the victualling of the party, and with the Bedouins ever threatening their flank. They were real warlike expeditions, undertaken from time to time, and recorded on the monuments; the officials raised stelai upon Mount Sinai containing the names of more than a hundred chiefs.

[1] Flinders Petrie, *Researches in Sinai*, p. 110.

2. PREHISTORIC COPPER MINES AT CHRYSOCAMINO, NEAR GOURNIÀ, IN CRETE

Near the Minoan city of Gournià, at the head of the Gulf of Mirabello, in the eastern part of the island, is a place which the indigenes call χρυσοκαμινο (Chrysocamino), which signifies "oven of gold." Dr. Hazzidaki found here a prehistoric mine of copper, which opens an unexpected and important field in the history of the Minoan people and of Mediterranean civilisation. Near the sea in the little gulf called Paschia Ammos, in the locality of Chrysocamino, he found a quantity of scoriæ and cinders, with fragments of vases, which were probably crucibles for smelting the mineral. These remains of smelting operations were about 6 metres from the sea, at a point where the shore rises for about 20 metres.

At Dr. Hazzidaki's first visit he had picked up a piece of metal and two pieces of black and spongy scoriæ, and he gave them to me to analyse. At first the metal seemed to be a piece of native copper stuck to a piece of gangue.[1] The smaller piece of scoria contained a large proportion of copper, and the larger piece contained a small quantity of copper. The presence of copper and of scoriæ containing copper being evident, I asked Dr. Hazzidaki to return to the same spot to make further search, for he had told me that there was a cave at Chrysocamino in which he had found pieces of crockery, and whence the mineral had probably been obtained

Dr. Hazzidaki again undertook the long journey from Candia, and we have to thank him for having enabled us to make certain that in the Minoan age there had existed a copper mine at Chrysocamino, at the head of the Gulf of Mirabello. After this second visit he wrote me as follows: "The seashore rises for above 100 metres, and here is the cave with so small an entrance that one has to go down and creep in on hands

[1] An analysis showed: Protoxide of copper, 45·05 per cent.; oxide of iron, 2·40 per cent.; gangue, containing silex, alumina, and calcare, 23·80 per cent.; the rest was carbonic acid, water, oxygen, 28·75 per cent.

and knees. The cave is 52 metres long, the roof is irregular in height, about 2 metres near the entrance, that is, 2 metres from it, and in the middle it reaches a height of 20 metres, and at the far end it is 12 metres high. The walls and roof are covered with stalactites, and the rock is calcareous. Great blocks of stone have fallen from above, especially at the far end of the cave." Here Dr. Hazzidaki found an almost intact cup of the Early Minoan II. period. In the visit made in 1906 Dr. Hazzidaki had found pieces of pottery of the primitive period, with many fragments too small for their date to be established. He also picked up part of a small pot with white decoration on a black ground, belonging to the period Middle Minoan III. From the collection of fragments of crockery we may consider that the mineral was mined here during a long period of time. That smelting operations were carried on near this cave is proved by the piece of crucible picked up by Dr. Hazzidaki, of which I give an illustration, half the actual size (Fig. 164). There are two other pieces of the same shape (not illustrated). Some pieces are 2 centimetres thick, others only 1 centimetre, so that they must be pieces of different crucibles. All are of clay, deep red in colour, and rough externally, black, and as if vitrified on the inside, with irregular surface and slightly spongy. On these pieces of crucible we can see the traces of the very high temperature to which they have been exposed, for it has fused the clay. The holes in these crucibles have a diameter of 20 millimetres, and are irregularly disposed. They are large, because they serve as a gridiron, and the pieces of metal are put upon them for smelting. Pieces of metallic scoriæ are still found in some of the holes.

Dr. Hazzidaki sent me two other pieces of scoria found in the cave; on analysis I found that they were really the residue after the fusion of copper ore. They are heavy, and are of a dark, blackish colour. A qualitative analysis of the scoriæ showed the presence of copper and iron. The samples of rock taken from the walls of the cave are of calcareous, dolomitic breccia, but none of the samples which I received contained any copper ore.

This was not surprising, for the same thing happened with regard to the celebrated mines of Mount Sinai, where, as Dr. Berthelot says, there is no longer a trace of the mineral from which copper was extracted during so many centuries from the days of the first Pharaohs.

For breaking up the ore the workers probably used double axes, similar to that found at Gournià by Miss Boyd (Fig. 178, A, 965), the most worn-out copper implement found in any of the Cretan excavations. For in Crete, as at Mount Sinai,[1] the method of extraction was to reduce the copper ore into small pieces and to put it into clay ovens, of which a fragment is shown on Fig. 164, hastening the process by the use of the bellows.

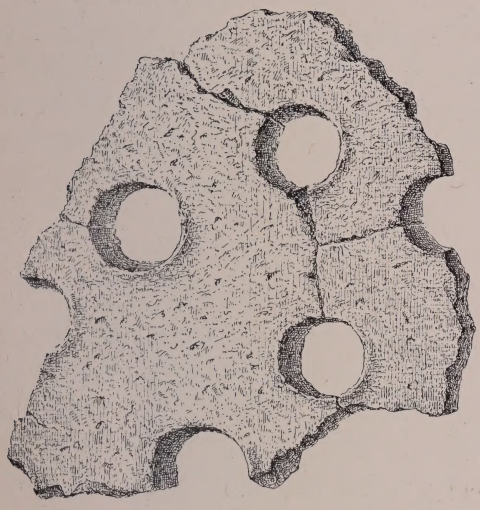


FIG. 164.—PORTION OF A CRUCIBLE FOUND AT CHRYSOCAMINO, CRETE. HALF THE ACTUAL SIZE.

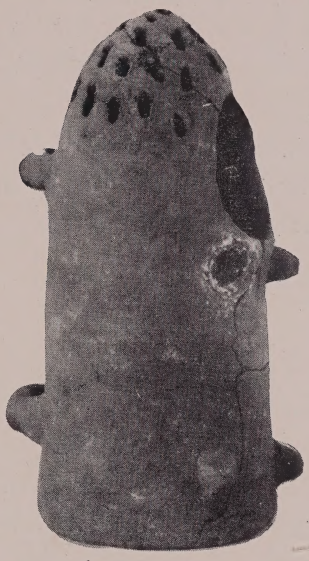


FIG. 165. — CRUCIBLE FOR SMELTING COPPER ORE, DISCOVERED AT ZAKRO, BY DR. DAWKINS.

After finding at Chrysocamino the ore containing protoxide of copper, as well as the scoriæ, which retained, as was shown by analysis, a residue of copper, we may assume the existence

[1] J. de Morgan, "L'âge de la pierre et les métaux," *Recherches sur les Origines de l'Egypte*, 1906, p. 217.

of a copper mine. That the furnaces for smelting the copper were here is shown by the large earthenware crucibles, with remains of scoriæ adhering to the apertures. The fusing of the ore was probably carried on, not only in the cave, but also lower down by the sea, where it was easier to carry the fuel. Possibly, when the ore in the cave was exhausted, copper ore may have been brought from the Island of Gaudos, of which I shall speak later on. It may be noted that Gournià is the place which is richest in objects of bronze, and where moulds for casting knives, double-headed axes, chisels, &c., are specially plentiful. At Pachia Ammos, 2 kilometres west of Chrysocamino, there are on the beach pieces of scoria like those at Chrysocamino, which I analysed, and Dr. Hazzidaki writes that there are at the head of the gulf many scoriæ from the copper mines of Chrysocamino which have been thrown into the sea in prehistoric times.

An indirect proof of these smelting operations is, I think, supplied by certain vases, whose purpose is unknown, but which are probably crucibles used for fusing the copper ore. The crucible (Fig. 165) was found at Zakro, in the eastern part of the island, not far from the mine of Chrysocamino. Dr. Dawkins,[1] who has described it, says that it is like the modern scaldini now used in Italy, but I cannot agree with him on this point. An examination shows that it has been subjected to a very high temperature, and traces of this are visible in the illustration, where the cracks are shown. It is of stoneware, and the change it has undergone proves that it has been used as a crucible for fusing metals. The handles for moving it by must be filled with some heavy incandescent metal. The ore to be smelted was perhaps put in by the large round aperture which is seen above. The crucible was heated in a vertical position, and was then lifted by means of green branches and the fused metal poured out by the small holes. It could then be filled afresh, and another fusion begun without allowing the crucible to cool. The bellows

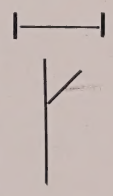
[1] *The Journal of Hellenic Studies*, xxiii. 1903. Dawkins, *Pottery from Zakro*, p. 258.

were probably used to hasten the smelting process. If this was the case, the form of the crucible appears to be well adapted for keeping up a current of air, which would intensify the action of the fire in producing the so-called calcination.

3. ARCHÆOLOGICAL EVIDENCE

The Italian Archæological Mission found in the villa of Haghia Triada nineteen large pieces of copper, each weighing about 30 kilogrammes. Fig. 167 shows some of these ingots piled up as they are in the Museum of Candia. After the first account by Dr. Paribene,[1] Professor Pigorini's study of them appeared, giving the measurements and weights, and of some a drawing also.[2] I will add here a few notes on their origin. Upon them appear the characteristic signs—palm, double axe, twigs, &c.—which are found incised on the blocks of stone in the palaces of Phæstos and Knossos.

The surface is wrinkled, as is usually the case with large blocks of smelted copper, and the blocks have the characteristic green colour of the oxide and carbonate of this metal.[3]



The first is marked near the top with a horizontal line, ending in two small vertical lines; beneath this is a vertical line with another line, joining it at an acute angle. The second ingot bears a cross, and below it other lines resembling an M. Like the others, they are incised with a chisel and not very distinct. On the third ingot is a trident, ⋔. In spite of the fact that one is square

[1] Paribene, *Rendic. Accad. Lincei*, xii. p. 317.

[2] Pigorini, "Pani di rame provenienti dall' Egeo scoperti a Serra Ilixi in Provincia di Cagliari," *Bull. paletn. ital.*, xxx. 1904, p. 91.

[3] The chemical analysis of a piece of copper taken from an ingot weighing 38 kilogrammes gave the following result per cent. : Copper, 98·606 ; zinc, iron, 0·630 ; lead, 0·034 ; sulphur 0·445. The ingots are therefore of pure copper, differing in shape. The first is larger than the third to the left. The measurements are—

	Length.	Breadth.	Thickness.	Weight.
1.	0·45	0·39	0·04	27·300
2.	0·37	0·35	0·06	27·000

and the other rectangular, each block weighs 27 kilogrammes, suggesting the idea that they may have represented a special weight, termed by some the *talent*. However this may be, the fact that the one with smaller superficies is 2 centimetres thicker than the other, shows what skilful smelters the Cretans were, capable of measuring and handling with exactness a large incandescent mass of melted copper. One of the ingots found at Serra Ilixi in Sardinia bears the characteristic sign of the Minoan double axe, so common upon the blocks of Knossos. Professor Pigorini has made a study of these, and gives also the chemical analysis.[1]

FIG. 166.—CRETAN FROM THE TOMB OF REKHMARA, XVIIITH DYNASTY.

In the tomb of Rekhmara in Egypt (1500 B.C.), where there is a representation of the Cretans bringing gifts to Thothmes III. of the XVIIIth Dynasty, two of the figures are shown carrying on their shoulders an ingot of copper of the same form as those found at Haghia Triada. Fig. 166 is taken from the work of Dr. Virey.[2] Both these Cretans wear the characteristic embroidered loin-cloth with the belt, and also the characteristic Cretan shoes. Besides the ingot of copper on their shoulders, they carry a vase (Fig. 166), whose shape is identical with that of the *rhytons* found at Phæstos and Knossos.[3]

In the excavations of Cannatello I found a piece of copper which appeared to have been taken from an ingot similar to

[1] Pigorini, *Bull. paletn. ital.*, xxx. p. 105.

[2] Virey, *Le Tombeau de Rekhmara*, Plate V.

[3] Dr. Hazzidaki, Ephor of Cretan Antiquities, has lately written to tell me that a talent of copper identical with the other nineteen of Haghia Triada had been found at Tiflissos, two hours west of Candia, where a Minoan palace of the period Middle Minoan I. was discovered.

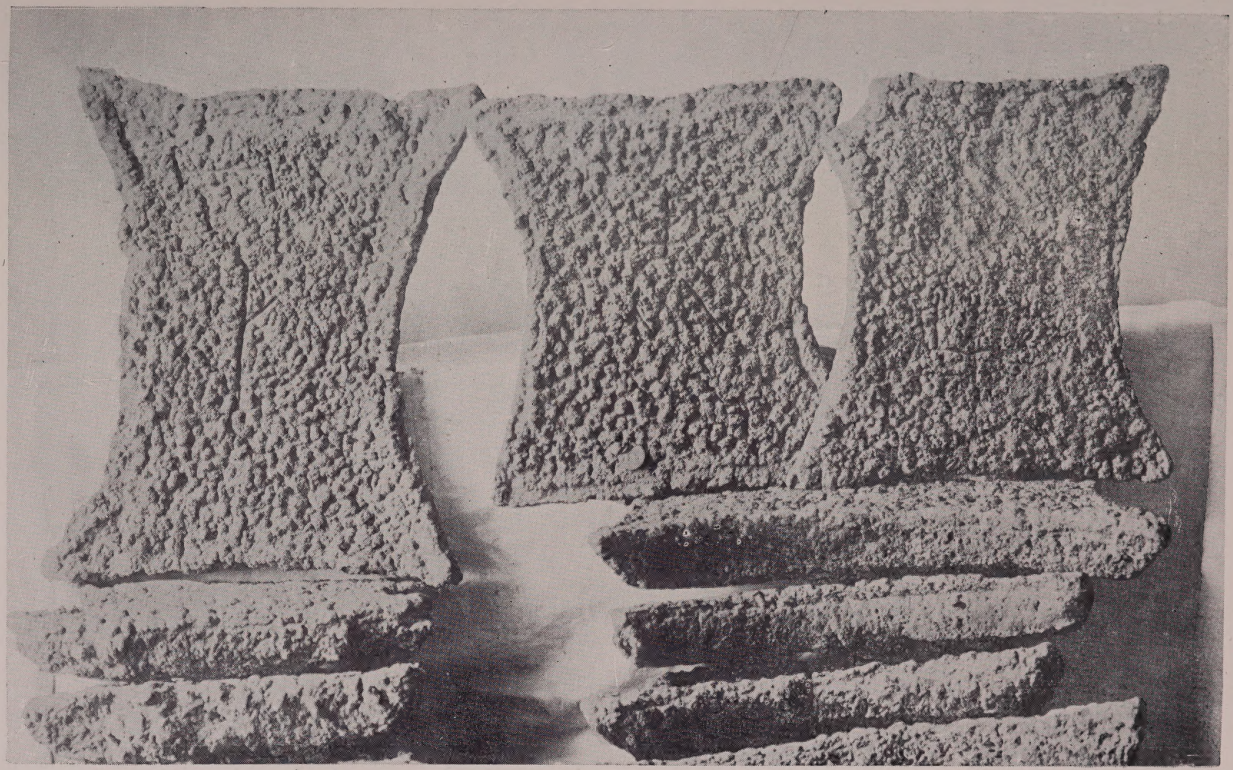


FIG. 167.—INGOTS OF COPPER, DISCOVERED AT HAGHIA TRIADA.

those in Crete. It is broken, and is 5 centimetres thick, the surface wrinkled on both sides and showing a fibrous appearance on the part where it had been separated from the ingot. It is about 8 square centimetres in size, and the analysis showed it to be pure copper. There is a piece in the Prehistoric Museum of Rome with two ingots presented by the Cretan Government. In Candia too there were some which had been broken. The fragment which I found at Cannatello confirms the idea that these ingots were used for metallurgical work, and that pieces were broken off as required to mix with tin for making bronze, or to be used simply as copper and to be fused or laminated.

The fact of copper ingots marked with Minoan signs having been discovered in Sardinia, and a piece of one of the same ingots in Sicily, proves the extension of the commerce carried on by the Cretans with their copper in the countries of the Mediterranean.

4. MYTHOLOGICAL RECORDS OF METALLURGY AND THE MINES OF GAUDOS

Mythology makes up in part for the silence of literature upon the origin of metals, and points to Crete as the cradle of prehistoric metallurgy. Diodorus [1] states that the Dactyli Idæi are anterior to Minos. Rhea, daughter of Ouranos and Ge (that is, of Heaven and Earth) was mother of Zeus. The legend tells how, when she came to Crete for the birth of Zeus, where she rested her hands on Mount Ida, the Curetes [2] sprang up from the impression of her hands. And every one knows that the Curetes, by striking their shields, drowned the cries of Zeus that he might not be discovered by his father Kronos, who would have eaten him. Here we probably have an allusion to the noise of the forges and of the hammers striking the anvils. That this legend had a real foundation became known in 1907.

Opposite Mount Ida rich veins of copper were discovered in the Island of Gaudos. This island, called Gozzo by the

[1] V. 64. [2] Schliemann, *Troy*, p. 318.

Italians, is about 8 to 9 kilometres in length, of triangular shape, and lies in the sea, opposite Sphakia, at a distance of about 30 kilometres. In the midst of serpentine rocks there is a vast deposit of rich copper ore, and the Government of Crete has been asked to authorise the working of these mines. When the deposits of Chrysocamino were exhausted the ore was possibly brought from this island. Professor Spezia, Director of the Mineralogical Museum of the University of Turin, to whom I presented some samples of the ore from Gaudos, recognised them as sulphate of copper, partly modified, with production of malachite and hydrocarbonate of copper.[1]

The Dactyli Idæi took their name from their skill with their fingers in making vases for Rhea. In Phrygia her priests, the Corybantes, made noisy and orgiastic music with metal disks and drums. The Curetes, the Corybantes, and the Dactyli are the spirits of metallurgy. At Vetulonia Professor Milani found the bronze statue of one of the Curetes holding a mace, with his shield at his back and crested helmet on his head. The Curetes and Dactyli are constantly found on the Etruscan monuments, and others bear visible signs of the cult of Zeus and Rhea.

It is asserted that the Homeric poems were composed towards the end of the bronze age.[2] In Homer there is no distinction between copper and bronze, and the word *chalkos* is used promiscuously for both copper and bronze. Nor is there any

[1] The analysis made in the Chemical Laboratory of Turin gave :—

Oxide of copper, with traces of metallic copper ...	50·00	per cent.
Sulphur	0·137	„
Arsenic and antimony	0·080	„
Gangue, silica, alumina, lime	27·00	„
Oxide of iron	5·10	„
Water and carbonic acid	17·683	„

[2] "Commentators have calculated that the word 'bronze,' with its derivatives, appears 320 times in the Iliad and 90 in the Odyssey, while the word 'iron' appears only 23 times in the Iliad and 25 in the Odyssey."—Th. Day Seymour, *Life in the Homeric Age*, 1907, p. 298.

indication in the Homeric poems as to where copper and bronze came from. When Homer says that Sidon was rich in bronze it is impossible to make out whether he indicated the land of the Phœnicians as the source of bronze, or simply pointed out the riches of that city. It is surprising, too, that the Greek language, which had at the time of the Homeric poems already acquired such precision, should not have had separate words for such different things as copper, which is red and malleable, and bronze, which is hard and yellow. The inexhaustible riches of the Homeric poems in the representation of the world of fact profit us nothing in our study of the moment.

CHAPTER XIX

IS CYPRUS REALLY THE LAND OF COPPER?

I. ORIGIN OF THE WORD "CUPRUM" AND OF BRONZE

I PUT my own courage, as well as that of my readers, to the proof by rowing against the current and declaring the falsity of the commonly held opinion that the copper industry originated in Cyprus. The Greeks did not give the name of Cyprus to the island on account of its copper mines, or they would have called it rather Chalcis, like a city in Eubæa, where, says Pliny, copper was first discovered. This mine of Chalcis was, however, poor, and was soon worked out. We find in Homer proof that the ports most celebrated for their trade in copper and bronze were not those near the mines, for he speaks of Sidon's great wealth in bronze when there are no copper mines near Sidon.[1] Bronze had its name from Brindisi, which also has no copper mines, but which was at the beginning of the Christian Era celebrated for its mirrors, made of a blend of copper and tin, whence the name of bronze arose, "Brundusini speculi," as they were called at that time.[2]

Up to the present there is no evidence that copper was worked in the Isle of Cyprus before it was used in Egypt or Crete; and it is probable that the same thing happened in the case of the word *cuprum* as in the case of bronze, that is, that the

[1] Movers, *Das phönizische Alterthum*, p. 67.

[2] Berthelot, *Introduction à la Chimie des anciens et du moyen âge*, p. 275. *La Chimie au moyen âge*, pp. 21 and 356.

name was not derived from the existence of mines, but from the tradition of the trade in copper, for which there was a market in this island. The word *Cyprus* comes from the name of the plant κύπρος, which is the henna (*Lawsonia inermis*), used for dyeing the nails red. It is a pale green shrub with whitish bark, and the white flowers have a sweet scent. The leaves, when dried and pounded, yield a red colour, which is used by the women of the East for staining the lips and nails. We know that this custom was already in vogue in Egypt at the time of the first dynasties, and has been preserved in the East to the present day, so that every one has heard of the use of henna.

The persistence of certain fashions and of incomprehensible customs in the decoration of the body, which have lasted from neolithic times till our own day, is worthy of more serious study on the part of anthropologists than it has received. Besides this custom of staining the nails and the tips of the fingers red, there is another characteristic fact in the psychology of Egyptian civilisation. Both women of the people and ladies paint a green circle round the eyelids, and surround this with an oval black line. We see this same style of painting on Fig. 144, B, which represents an idol of the neolithic period. It is of plain earth hardened in the sun, and round the large eyes at the edge of the eyelids was painted a green line, surrounded on the outer edge by a black one. The name *cuprum*, adopted by the Latins for copper, must be of late origin, for in the remote age which we are now considering the Latin language probably did not yet exist.

The bankruptcy of the Phœnicians was one of the most clamorous events in history, and it was the excavations in Crete and Sicily which gave the decisive blow and reduced the legend of this people to humble limits. First, the glory of being the birthplace of Aphrodite was taken from Cyprus, because the same nude goddess, with arms crossed on her breast, was found in Crete ; and as this idol came to light in the neolithic soil of Knossos, we had to acknowledge that this same goddess was worshipped in Crete many years before the Phœnician Astarte

was heard of. Alchemists gave to copper the name and sign of love when they called it "Cypris," and now we are turning the bistoury of criticism even against this glory of Cyprus. Possibly there will be the autopsy of another legend; but not for this will love and money remain without a fatherland.

2. PREHISTORIC MINES IN CYPRUS

Two friends of mine spent many years in the Isle of Cyprus, making excavations for archæological purposes, and both published works full of valuable material illustrating the antiquities of the island. Count Luigi Cesnola, Director of the Museum of New York, who was thirteen years in Cyprus, writes in his description of the island:[1] "I made considerable excavations in the mountains and hills searching for the ancient mines of Amachus, which were considered as the richest and most extensive of Cyprus. I hoped to find scoriæ or other indications, but I found nothing to identify them by. I made other excursions upon the plain and in the mountains of Mesaoria, where the city of Tamassus is said to have stood, but here, too, I found no trace of copper mines."[2] I then applied to the English Government through our Ambassador, the Marchese di San Giuliano, and in answer to my questions was told that no recent search or exploration had been made to find deposits of copper, and that, so far as was now known, it is not possible to affirm that any mines of copper are being worked in Cyprus. I owe this information to Professor Wyndham Dunstan, who made a report to Parliament on the condition of Cyprus in 1905.[3]

[1] L. Cesnola, *Cyprus*, 1877, p. 284.

[2] I inquired of his brother, Alessandro Palma di Cesnola, who had remained five years in the Isle of Cyprus, and was the author of *Salamina*. He answered that he had never heard copper mines mentioned on the island, and that there was no trace of worked-out veins of copper, either ancient or modern, and that in all the excavations he had made, he had never found the least sign of any mine of copper.

[3] W. Dunstan, *Report on the Agricultural Resources of Cyprus*, September, 1905, p. 24.

From another publication [1] of the English Government, I learn that the Ancients probably made use of secondary deposits, which were found on or near the surface of the ground, and were produced by the decomposition of the pyrites which lie deep down in the earth. The presence of copper may be inferred from some mineral springs which contain this metal and deposit it in the form of scales of a pale green to the blue-green colour of malachite.[2] Strabo [3] mentions these incrustations of copper, which were used in medicine. [4]

In conclusion, there are no prehistoric traces of ancient mines, but this does not say that none have ever existed, for in Crete, too, we found no copper ore in the cave near the furnaces ; and it may be that in Crete, Cyprus, and on Mount Sinai (as Berthelot asserted), the deposits which contained infiltrations of the metal may have been exhausted. It is the subterranean waters which attack the pyrites deep down in the earth, and bring to the surface the product of the oxydation of the copper and of the carbonates which impregnate the earth. This substance, being diffused on the surface of the earth, was collected, and was soon exhausted.

A large ingot of copper found at Enkomi, in the Isle of Cyprus,[5] would show that mines had been worked there. This ingot is identical in shape with those found at Haghia Triada (Fig. 167). On the top was incised a character of the Cypriot script, corresponding to the syllable *si*.

Students of Minoan and Mycenæan antiquities now agree in recognising in the Cypriot script a late derivative of the

[1] *Bulletin of the Imperial Institute*, vol. iv. 1906, p. 213.

[2] It is a silicate of copper known by the name of "chrysocolla," in which there was an active trade in ancient times, but that certainly could not be of use in a great copper industry, because it was too scarce.

[3] XIV. 5, p. 583.

[4] E. Oberhummer (*Aus Cypern. Zeitschrift der Gesell. für Erd Kunde*, xxv. 1890, p. 224) made a report upon the copper mines which he visited in Cyprus ; he studied the scoriæ found at Limni, and distinguished the scoriæ of the Phœnician period from that of the Roman period.

[5] *Bullett. paletn. ital.*, xxx. 1904, p. 97.

Mycenæan script. Considering the shape of the ingot of copper, and the archaic form of the character, it is most probable that the piece of copper may be of the Mycenæan period.

We have no evidence as to when the extraction of copper from the mines of Cyprus ceased. Pliny mentions them, but we cannot make out whether the metal was extracted in his time or was only worked, for he says that another quality of copper was prepared at Capua, and was less good. This indication, which connects Cyprus with Capua, gives the impression that the mines were no longer working, and that copper brought from other places was worked in Cyprus.[1]

3. COPPER WEAPONS AND PREHISTORIC POTTERY IN CYPRUS

Dr. Myres[2] attributes great importance to the discovery in Cyprus of a flat axe of copper similar to the axes used in the neolithic age. Identical axes have been found in Egypt by Dr. Petrie, Mr. Quibell, and others, but with this difference, that in Egypt the neolithic deposits have been found, while in Cyprus, as Dr. Myres allows, no strata of the neolithic period have been yet discovered. Even the blades are not of a primitive archaic type, and the short blades of copper discovered at Haghia Triada are of much earlier date, as their form shows.

Dr. Montelius gives the bibliography of the works published on Cyprus,[3] with the chemical analyses and illustrations of the copper knives and of the flat axe of copper found in Cyprus. All these objects were discovered with a bronze axe, and must therefore be attributed to a later age than that which we are now studying. Dr. Montelius points out the interesting fact that weapons of pure copper, or with a minimum proportion of tin,

[1] *Hist. Nat.*, xxxiv. 8–20.

[2] Myres, "Copper and Bronze in Cyprus and South-East Europe," *Journal of the Anthropological Institute*, November, 1897, p. 171.

[3] In the Museum of Stockholm there are two flat axes from Cyprus, one of copper, the other of bronze. Both have been published by Dr. Montelius (*Die Chronologie der Ältesten Bronzezeit*, Fig. 11, 366).

were found in Cyprus at a late period; for the flat axe, to which considerable importance was attributed by Dr. Myres, contains only traces of tin—0·08 per cent.

The researches made by Dr. Ohnefalsch-Richter,[1] with the assistance of the Emperor of Germany and the Virchow Fund, have brought to light objects of bronze containing from 10 to 11 per cent. of tin. Two objects which Dr. Ohnefalsch-Richter illustrates[2] are considered by him to be chisels, but are probably flat axes. There is a sword measuring, with its handle, 63 centimetres in length, and this fact confirms the opinion that these deposits are not of great antiquity.[3] Nor does the pottery of Cyprus give that island a foremost place in Mediterranean civilisation, and neolithic deposits are, as I have already said, unknown up to the present day. It may be predicted with certainty that neolithic deposits will be found, because their existence in the whole region of the Aegean renders it impossible that they should not exist in Cyprus also.

After what I have said, the reader will hardly accept the statement of Dr. Ohnefalsch-Richter, who, though he has never made excavations in neolithic strata, believes "that pottery certainly originated in Cyprus,"[4] and that "the whole of the culture of Cyprus is autochthonous."[5]

[1] Ohnefalsch-Richter, *Zeitschrift für Ethnologie*, 1899, pp. 29, 43.

[2] *Op. cit.*, Figs. XX. 2, XXI. 3.

[3] Including the daggers of the British Museum, eight analyses of copper objects have been made against seven of bronze, besides another dagger. There are eight pieces containing from 8 to 11 per cent. of tin.

[4] *Op. cit.*, pp. 43–4.

[5] Dr. Ohnefalsch-Richter remained twelve years in Cyprus for the excavations, and has published one of the most valuable works on the antiquities or this island (*Cypros*, Berlin, 1893), with many illustrations. Another important series of researches is that of Smith and Walters, published by Murray (*Excavations in Cyprus*, London, 1900). All these recent excavations have added nothing to our knowledge of the ancient weapons of copper and bronze. A fresh search, with the object of discovering deposits of the neolithic age, would be a most useful undertaking.

CHAPTER XX

THE MOST ANCIENT WEAPONS OF COPPER AND BRONZE

I. THE EXCAVATIONS OF PHÆSTOS AND HAGHIA TRIADA

THE double axe made of copper (Fig. 168) is one of the most ancient weapons of known date; I found it with Dr. Pernier, and it came to light in the stratum of earth below the layer of lime, among fragments of Kamares vases in the primitive palace of Phæstos.[1] It dates from the period Middle Minoan I. and is probably contemporaneous with the XIIth Dynasty in Egypt.

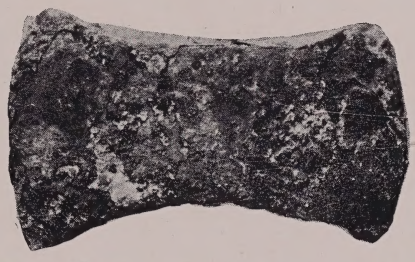


FIG. 168.—DOUBLE AXE OF COPPER, FOUND IN THE FIRST PALACE OF PHÆSTOS.

Among the charcoal I found a stone to which a piece of a blade and some metallic scoriæ were attached. I thought at first that it was a piece of a crucible in which some pieces of knives had been fused to make other weapons. On analysing it, however, I found that though it looked like a crucible it was sulphate of lime or gypsum. The heat of the fire which destroyed the first palace was so intense as to liquefy the objects of bronze.[2] Another piece of fused metal had stuck to the

[1] Length, 105 millimetres; thickness, 30 millimetres at the centre.

[2] The blade of the knife contained: Copper, 89·50 per cent.; tin, 3·146 per cent. The fused and spongy piece of metal: Copper, 63·80 per cent.; tin, 2·35 per cent.

pavement. By analysis it was found that the stone was gypsum, and the metal a blend with a small proportion of tin—copper, 89·40 per cent.; tin, 1·57 per cent.

A nail which I found among the ruins of the most ancient palace of Phæstos gave on analysis: Copper, 84·00 per cent.; tin, 3·16 per cent. A piece of a lebes was of pure copper. We see from these examples that the bronze objects of the first palace of Phæstos were made either of a blend containing only a small proportion of tin, or of pure copper. We cannot suppose that the quantity of tin would be diminished by the fire, as tin is little or not at all volatilisable by heat, so must conclude that tin was scarce at that time. Five chemical analyses are not enough to give certainty; but I should not have expected such uniformity, and the agreement of the results is such as to allow us to conclude that the most ancient palace of Phæstos was flourishing at the time when bronze first began to be used, but that tin was used with great economy, the various blends having a lower percentage of tin than true bronze.

The Italian Archæological Mission discovered near Phæstos another *tholos*, which has been illustrated by Dr. Paribene.[1] Besides some stone vases of archaic type, some vases of the Kamares type were found, and also a small blade of copper, which represented a small flat axe. There were six daggers, of which I reproduce two (Figs. 169, 170). I omit other blades from the Museum of Candia, as I had already published them,[2] and the illustrations in the next chapter of the same type of weapons found in Italy will suffice to give an idea of these.

One striking difference is the greater length of these daggers in comparison with the preceding ones. A rule confirmed by many examples is that as civilisation grows so do the weapons. Two noticeable points are the absence of swords at Troy and their presence at Mycenæ, which circumstance would establish

[1] *Monumenti Antichi*, vol. xiv. p. 679, Plate XLIV.

[2] "Le armi più Antiche di rame e di bronzo," *Memorie R. Accad. dei Lincei*, 1907, Plate I. Figs. 7, 8.

the fact that the ruins of Mycenæ are later than those of Troy. In the beginning the daggers are very short, later on they are

FIGS. 169, 170.—BRONZE KNIVES FOUND AT HAGHIA TRIADA, NEAR PHÆSTOS.

longer, and at the end of the blade is a square tang 3 or 4 centimetres in length, which serves to fix the haft on with. In

my paper on the subject I point out how the blade is narrow in the upper third, then widens at the middle and narrows again towards the point. This is a characteristic of Mycenæan swords which is observed in Crete at their first appearance. The point, as in the primitive triangular daggers, narrows with a rapid inclination of the cutting edge from the central part of the blade to the point. The analysis shows that they are of perfect bronze.[1] One dagger with a narrow-tongued blade contains 14·22 per cent. of tin. The knife (Fig. 169) with three rivets at the base to fix the blade into the haft was found in this *tholos;* it is 21 centimetres in length and 58 centimetres in breadth at the base, with the point blunted. This double-edged blade is one of the commonest forms in Crete and on the Continent of Europe. The rivets have the heads turned down on both sides and are of copper. Of the same period and identical with these is a knife found at Tourlotì di Sitia. I was able to analyse it, and found that it was of a good blend.[2] It is a double-edged blade with obtuse point.

Up to this time only pointed weapons were used ; but now the blades become longer and are made with a double edge as it becomes less difficult to procure the metal. One of these daggers, belonging to the earliest bronze age, was found by Professor Tsountas at Sesklos. Later on they became common, and are abundant in the terremare and beyond the Alps, and even in England.[3]

Fig. 170 represents another blade found in the same *tholos.* It is 135 millimetres in length and has three apertures at the base for fixing on the handle with two bent rivets. Knives like those of Figs. 169 and 170 are common in Italy and on the Continent.

The manufacture of arms shows such good progress in the quality of the blend of bronze, the workmanship, and the invention of new types that, independently of other reasons, such as the

[1] Copper, 88·70 per cent. ; tin, 9·480 per cent.

[2] Contains copper, 90·88 per cent. ; tin, 8·65 per cent. It has a square base without tang, and three small rivets set in a line along the base.

[3] John Evans, *The Bronze Age*, 1882, p. 256.

type of the pottery, also pointed out by Dr. Paribene, we must consider the bronzes of this *tholos* to be several centuries later in date than the former bronzes from Haghia Triada.

2. COPPER AXES

In the Museum of Candia there are numbers of axes and double axes, and these are of more varied shapes than in Italy and in Central and Northern Europe. To understand this diversity we must consider the difference of the culture of the Minoan people compared with that of the inhabitants of the Continent. The difference was certainly greater than that between Italy, Germany, Gaul, and the British Isles in the time of Julius Cæsar. It is only by taking into account the conditions of absolute superiority of Minoan civilisation and the quasi-savage state of the peoples of the Continent that we can explain this diversity. The great variety of the Cretan bipennæ and of the tools for working stone and wood found in the ruins of the palaces of Phæstos and Knossos would have been of little use to the Italians of that period, though the ships of Minos sailed the Mediterranean in every direction. This appears still more evident with regard to the arms *de luxe* like those of Knossos and Phæstos[1] with the hilt of gold—a thing unknown in Italy or Central and Northern Europe. The same thing would be the custom then that now happens in the case of the peoples of Central Africa and others, to whom the trader only brings the goods suited to their requirements and to their primitive way of life.

The art of working in stone had so far advanced in the neolithic age that the axes were everywhere beginning to be made with an aperture for fixing on the handle, and hatchets and hammers were made also. When copper first became known flat hatchets were made at first, being easier to cast. The difficulty of casting an axe so as to be thicker at the head,

[1] Savignoni, "Scavi e scoperte nella necropoli di Phæstos," *Monumenti Antichi*, xiv. p. 553.

for the hole, and with the blade becoming thinner to the cutting edge is a technical difficulty which was not at once faced by the primitive metal workers, who preferred making the flat axe, for which the mould was much easier to manage.

I made an analysis of the metal of the axe (Fig. 171) discovered at Hierapetra, and found it of pure copper, as

FIGS. 171, 172.—COPPER AXES DISCOVERED AT HIERAPETRA.

was also that of Fig. 172, which was discovered in the Cave of Chirocumadia at Hierapetra.[1]

The vases found by Miss Boyd with the axe at Haghia Photia show that this axe belongs to the earliest period of the

[1] Fig. 171 is 96 millimetres in length, and 60 millimetres in width. The aperture for the handle is 20 millimetres in diameter ; the thickness of the head is 35 millimetres. The axe, Fig. 172, was described by Miss Boyd. It is 135 millimetres long, 62 millimetres wide at the cutting part, 30 millimetres wide at the handle end—the latter 23 millimetres in diameter.

use of metals. These are perhaps the most ancient axes hitherto analysed ; they show the evolution undergone by implements for work in the first period during which metal was used.

It may be profitable to compare the early copper axes from Sicily with those of Crete to see the connection between the Aegean and the Continent. Fig. 173 illustrates a copper axe found at Mojo in Sicily, and a comparison with Fig. 172 shows that their form is the same, while the dimensions differ little, so that they may be considered to have a common origin.

That the archaic arms of Crete resemble those found in

FIG. 173.—COPPER AXE DISCOVERED AT MOJO, SICILY.

Sicily should not astonish us after what we know of the pottery of the neolithic age at Stentinello and Matrensa. Before the discovery of copper and bronze the relations between the Aegean and Sicily were already very close, also the stone implements of Sicily were the same as those of Crete, and I may recall the little flat axes worn as pendants from necklaces.

A necklace with little axes like those from Crete was found by Professor Orsi at Palma Montechiaro. It was made of rings of calcareous stone strung with two small stone axes, which probably hung down from the neck, one in front and the other at the back.

Many of the daggers discovered in Sicily are identical with

the most ancient from Crete, and I show as an example a blade from Monteracello (Fig. 174). The edges of this daggger are slightly curved with the concavity outward, and the point narrowing at the extremity, where it forms an obtuse angle with the line of the blade, approaching the type of a Cretan dagger, which has up to the present been absent from the arms of Mycenæ and Troy. The handle was fixed by four rivets, of which one has been preserved. Two apertures made by them have touched the edge of the knife; a flat rib runs down the centre of the knife. This type of knife or dagger is found in many places even in Western Europe. Knives with the haft fused with the blade, those which are concave-convex, or with a rounded point turned backward, all the characteristic forms of the knives of Troy or Crete, are seen in Sicily. Dr. Paribene discovered at Haghia Triada a dagger blade in bronze with a rivet of gold.[1] Professor Orsi found at Pantalica and Cassibile another dagger with a golden rivet to fasten the two parts of the ivory handle.

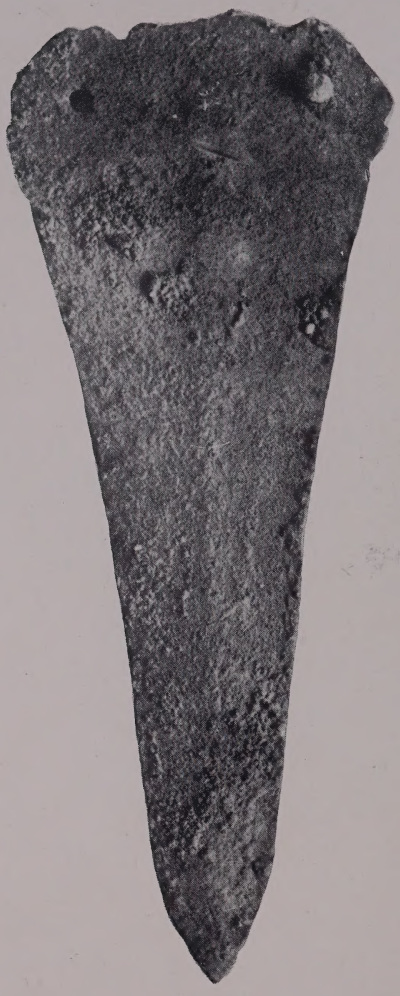


FIG. 174.—DAGGER DISCOVERED AT MONTERACELLO.

[1] Paribene, *Haghia Triada*, p. 727 (*Monumenti Antichi*, xiv. A).

3. THE FLAT AXES

Neither hatchets nor spear-heads with the socket were found in the excavations of Troy except in the sixth city, which corresponds to the Troy of the legend sung by the Homeric poets. However, as we must allow that the second city of Troy was already in existence in the first Minoan age, this study of arms will afford some useful opportunities for comparison with those of Crete, and for noting the differences which exist in the two countries washed by the Aegean.

In Troy there were no swords, but flat axes were plentiful, and these have not so far been found in Crete. In the treasury of the second city of Troy there were fourteen flat axes of bronze. The analyses made for Dr. Schliemann show that some were made of a blend poor in tin, and others of a rich one.[1] The result is that the flat axes of the second Trojan city, though identical in form, and possibly differing little in age, vary in chemical composition, the metal containing from 3 to 8 per cent. of tin. This shows that the form of the axes does not always correspond with the chemical constitution of the metal.

Dr. Schliemann was astonished at not having found any tools in the excavations of Troy,[2] and received an explanation of this from Dr. Dörpfeld, who said that the labourers would not live on the acropolis but in other parts where no excavations had been made. I believe that several axes which Dr. Schliemann described as battle-axes (*streitaexte*) were really chisels.

4. THE DOUBLE AXE

I analysed the metal of the great double axe which was discovered at Sitia (Fig. 175—the profile is represented half the actual size); the analysis showed it to be of nearly pure copper. A double axe from Haghia Triada, resembling in form Fig. 175, contains 18 per cent. of tin, an excessive quantity, for with more than 11 per cent. of tin the blend becomes less resistant and less

[1] Schliemann, *Ilios*, p. 532; *Troja*, p. 113. [2] *Ilios*, p. 106.

elastic, and therefore less good. On the other hand, the double axe (Fig. 156) found at Palaikastro by Dr. Bosanquet is poor in tin, for it only contains 3·71 per cent., and this might have been supposed on seeing how damaged it is, with the edge all bent on

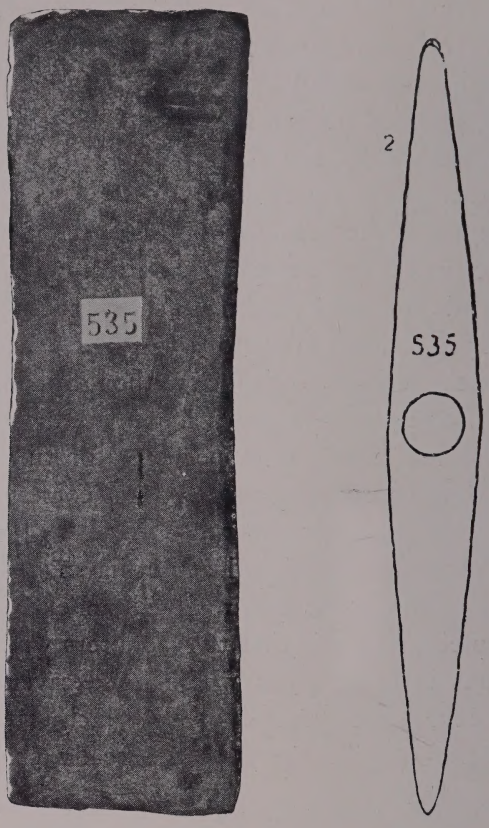


FIG. 175.—DOUBLE AXE OF COPPER DISCOVERED AT SITIA, CRETE.

one side. It is so worn on one side that the cutting part has become blunt and shorter by a centimetre.

At the beginning of metal-working there was no pure copper, and it was therefore not possible to make a blend for bronze with a constant composition ; also the best formula for the mixture was possibly not yet discovered. As for the poor blends, it would depend on the price of tin, in regard to which

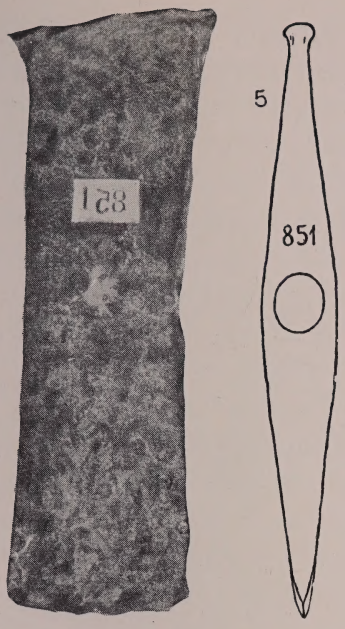


FIG. 176.—DOUBLE AXE FROM PALAIKASTRO, CONTAINING ONLY 3·71 PER CENT. OF TIN.

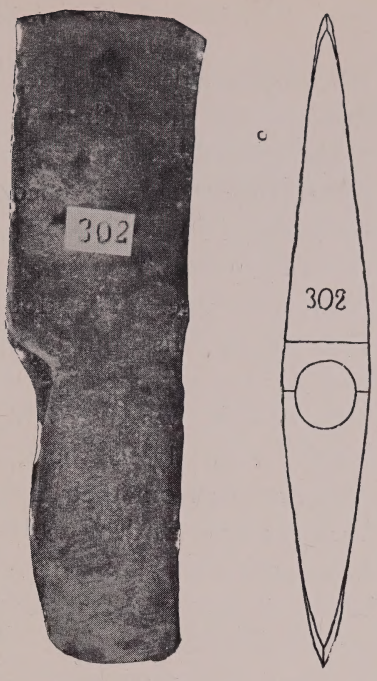
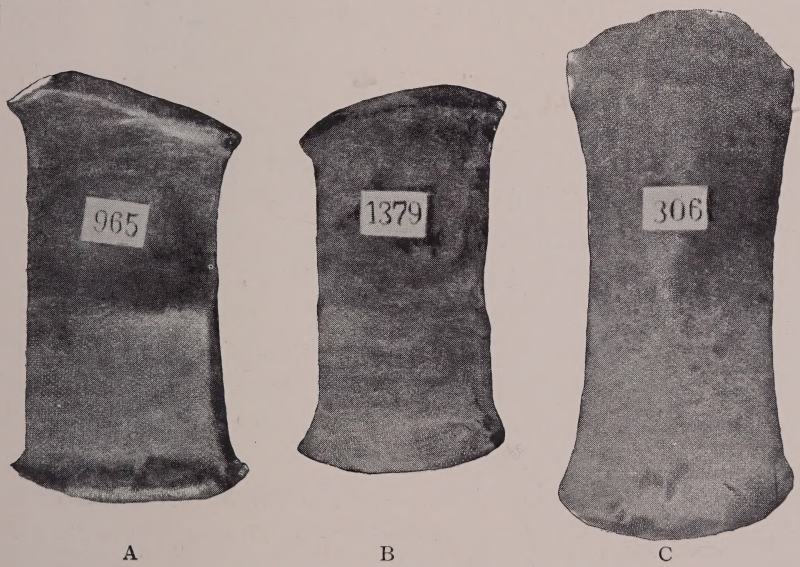


FIG. 177.—DOUBLE AXE WITH THE TWO POINTS UNEQUAL, DISCOVERED AT SELAKANO, CRETE.



A B C

FIG. 178.—CRETAN DOUBLE AXES MADE WITH AN ALLOY CONTAINING A SMALL PROPORTION OF TIN.

economy would be practised in the case of more ordinary implements. All these illustrations are half the actual size. I have made an analysis of three double axes of the same form, and found that they were made of blends of very different composition.

The double axes Fig. 178, A, B, show how much use could blunt the blade. The double axe Fig. 178, A, was found at Gournià by Miss Boyd, and probably served to break up the rock for the purpose of extracting the copper. The double axe Fig. 178, B, was discovered by Mr. Hogarth at Psychro. I have not analysed them, but they appear to be of copper. We can see from their damaged condition that they have not been rendered hard by a blend of tin. Fig. 178, C, is of a blend below the normal, for it contains copper 84·60, tin 4·169 per cent. It was found at Selakano, and it is not known to what period it belongs.

Sometimes axes are made thin at the part opposite to the broad cutting blade, as in Fig. 179, so that they could be used on this side also for cleaving or splitting. This form of axe marks the passing of the double axe, and this type was found of copper in Chios.

5. VARIOUS FORMS OF THE BIPENNÆ

The successive modifications of form in the bipennæ can be better studied at Candia than anywhere else. Fig. 177 shows a difference in the blades, one being narrower than the other. This axe was found at Selakano di Viano ; and, as the section shows, the handle is not in the centre. The axe Fig. 179 was discovered by the Italian Mission in the palace of Phæstos. The hole for the haft is rhomboidal in shape, one blade is vertical, parallel to the direction of the handle, and the other is horizontal and at right angles to the handle.[1]

To save time I will pass over the other forms of bipennæ,

[1] Dr. Montelius has described a double axe which differs little from this—it was discovered in the second city of Hissarlik (*Archiv für Anthropologie*, xxi. p. 20, Fig. 13).

such as certain axes pointed at one end and hammer-shaped at the other ; some have a large oval blade, with the aperture for the handle edged above and below by a border. Among the implements which most impressed me was a hammer with two ends like those of our blacksmiths ; the edges were quite spoilt —it was a hammer such as I have never seen equalled in an

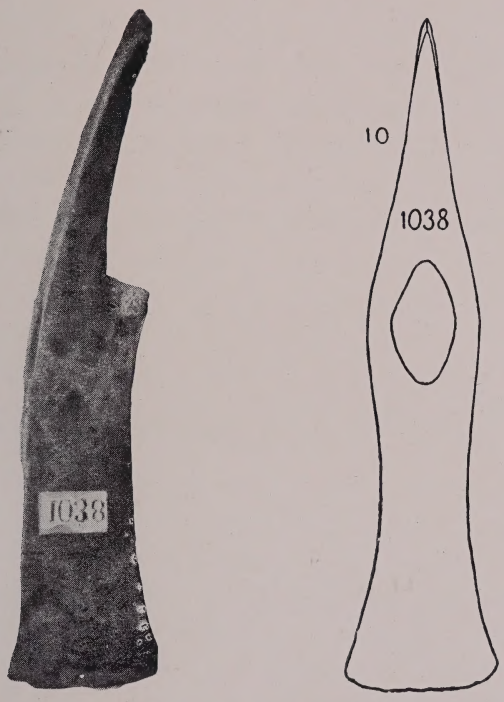


FIG 179.—DOUBLE AXE FROM CRETE, WITH THE BLADES IN A DIFFERENT PLANE.

Italian collection. The saws alone would, I think, suffice to show how well supplied were the Minoan workshops. In the Museum of Candia are several types of saw such as we now use. Some with the handle at one end, 4 or 5 centimetres in breadth and about half a metre in length. Others with holes at both ends are a metre and a half in length, and 2 or 3 millimetres thick. The teeth are made with surprising exactness ; in some there are large teeth alternately with small teeth regularly

arranged. For working ivory and small objects for inlaying there were small saws with teeth on both sides. The circular saw which has now come back into use was used already by the craftsmen of Minoan times.[1]

6. THE BIPENNÆ OF PHÆSTOS AND THE PROGRESS MADE BY CRETAN ARTISTS IN THE ART OF CASTING IN BRONZE

Possibly no other people were ever so industrious or such eager workers as the Minoan race. While in Italy and other parts of Europe metals seem to have been used only for weapons,

FIG. 180.—DOUBLE AXE DECORATED WITH A BUTTERFLY, DISCOVERED AT PHÆSTOS.

they were already used for tools in Crete at the end of the neolithic age.[2]

The marvellous perfection arrived at by the Cretans in the arts was produced by the work of centuries. To show their skill in the art of casting in bronze I give an illustration of a double axe from Phæstos (Fig. 180), discovered by the Italian Mission, which is certainly a masterpiece, surpassing everything known up to the present day. It was probably a weapon for ceremonial use, and was worthy of those princes of Phæstos and Knossos who wore the weapons with golden hilt, on which were engraved the lions

[1] Durm, *Ueber Vormykenische und Mykenische Architecturformen*, p. 44 (*Jahresheften des Oesterreichischen Archeologischen Institutes*, 1907).

[2] Halbherr, *Monumenti Antichi*, xiii. p. 69. In the prehistoric houses at Thera a bronze saw was found with stone tools and knives of obsidian.

chasing wild goats, and whose blade had a rib of gold decorated with minute, almost microscopic designs. On each side of this axe was a butterfly, stylised or, one might say, conventional in design, which is of importance in the history of art, not only by reason of its beauty, but also because it resembles the butterflies impressed upon the golden disks found by Dr. Schliemann in the third tomb of Mycenæ.[1] No such butterfly exists in nature, it was the Cretan artist who created a conventional type. The antennæ here spring from below the head, when they should come from the upper part. On all the disks from Mycenæ, as in this on the double axe, though they are produced from different moulds and in different forms, not one has the antennæ in the right place. The fashion in which the antennæ terminate is also incorrect, for they turn in a spiral, and also instead of four wings, as have all the lepidoptera, these butterflies have only two. Both in the butterflies of Mycenæ and those of the axe the wings are edged with festoon curves, and have an eye in the centre. These details, which are all from imagination, being identical in the golden butterflies of Mycenæ and in that of the double axe of Crete, prove the existence of a common school of artificers; it is not a question of a simple coincidence but of a common origin. In this case also we may admit that it was Crete and not Mycenæ that brought into vogue these stylised butterflies, for the palace of Phæstos is anterior to the tomb of Mycenæ.

This double axe must have been cast *à cire perdue*, for it would be impossible to produce so exact and finished a design as this butterfly with an ordinary mould. Along the edge of the axe run two lines with a channelled groove between; and this decoration too could hardly have been made without fusing, for it would be very difficult to work it afterwards in so polished and regular a manner.[2] The beauty of this double axe is such that no other weapon of the bronze age, except the daggers and

[1] Schliemann, *Mycenæ*, p. 196.

[2] This double axe is 22 centimetres long, 6 centimetres wide; thickness near the eyes, 24 millimetres.

swords from Mycenæ, of which I shall speak in the next chapter, can be compared to it. The double axe discovered in Cyprus by Alessandro di Cesnola,[1] and other weapons of Phœnician origin, will not bear comparison with this decoration cast in bronze.

The great perfection to which the art of casting in metal was brought in Crete is shown too by other objects. I recall a very beautiful example at Knossos—a graceful garland of leaves along the edge of a basin ; also a large vessel or lebes, of which only the upper edge with two handles had been preserved, and which was decorated with a beautiful design representing a wreath of crocus flowers. This lebes was found in the tombs of Kalivia, near Phæstos.

The bronze age in Crete shows such perfect work in the art of casting in metal that nothing can be found to equal it in artistic worth even in the North of Europe. The Phœnicians, who came after the Minoan civilisation, and were believed to be the artists who diffused the art of casting in bronze, remained inferior to the Cretan masters in the technique of metal-work and in the plastique of bronze.

[1] Alessandro di Cesnola, *Salamina*, Plate III.

CHAPTER XXI

THE AGE OF COPPER IN ITALY

I. THE EXCAVATIONS OF STATTE, NEAR TARANTO

SIR JOHN LUBBOCK,[1] in common with other authorities on the subject of palæethnology, did not admit the existence of an age of copper, that is, of a historical period during which copper was used without the addition of tin. This opinion originated in the rarity of copper weapons in Northern Europe, where the study of palæethnology began. As chemical analysis increased with the progress of excavation, it had to be admitted that there was a time during which tin was not known, and when implements and weapons were made of pure copper.

It is an instructive point in the history of industry that bronze was imported into England, although this country possessed the prime materials for making the blend. It was certainly in Southern England that it became known that by adding to copper another mineral, in appearance similar to lead, the copper could be rendered harder; but the inhabitants of Britain were not in a position to trade in this discovery, and it was the peoples of the Aegean who gave impulse to the copper industry, and later to that of bronze.

To show how abundant copper weapons were in Italy I need only refer to my own excavations, and I will begin at Taranto.

Dr. Luigi Viola, knowing that I was studying the neolithic period, presented me with two stone axes, of which I reproduce

[1] Lubbock, *The Prehistoric Age*, p. 52.

the photograph (Fig. 181). One is of porphyritic diorite (A), the other (B) is of serpentine hornblende, both rocks from the mountains of Calabria. Both are 19 centimetres in length and somewhat flat. They were both found by a shepherd, who brought them to his master, Nicola De Tullio. The stone of the axe A is greenish in colour, and when examined under the microscope appears to be a compact mass of small white crystals upon a ground of the colour of the olive fruit. The cutting edge is broken in parts, which proves that it has been

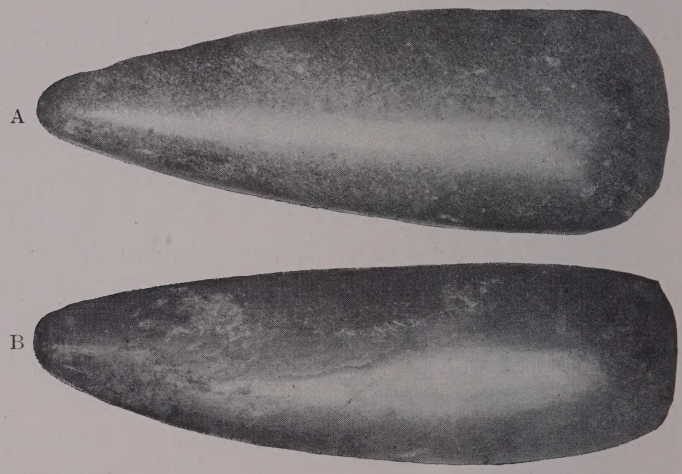


FIG. 181.—TWO STONE AXES DISCOVERED AT STATTE, NEAR TARANTO.

used ; the stone is very hard, and cannot be scratched with the point of a penknife, the surface is smooth and lustrous. The other (B) is darker in colour and rather chipped, and is diminished in thickness by natural incavations. A third axe, which was broken, had been found with these, but I was unable to trace it. These indications were more than enough to induce me to attempt an excavation, and I proceeded with Dr. Viola to the commune of Statte. At the point where the road descends towards Crispiano there is a great ravine (called in the dialect, *gravina*) ; here, to the right of the bridge, about half a kilometre from the road, is a place called the "Place of the Wolf." Guided

by the shepherd who had found these axes five years before, we began the excavation on March 18, 1908. On the first day we found only fragments of coarse vases made of black earth, of neolithic appearance. Some fragments of human bones made us think that it must be a place of burial. The calcareous earth showed here and there holes full of vegetable soil, in which grew clumps of bushes and coniferous trees.

We were on the margin of the gravina, a great fissure in the calcareous ground, about 40 metres in depth, at the bottom of which ran a little stream. On the second day we discovered among the fragments, together with two scrapers of dark flint,

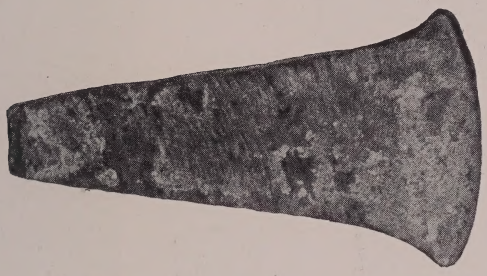


FIG. 182.—FLAT AXE OF COPPER DISCOVERED AT STATTE, NEAR TARANTO.

an axe of copper (Fig. 182).[1] All the vases were broken into small pieces, and it was impossible to recompose even one. Any one who knows the persistency with which the shepherds ferret about everywhere searching for treasure in their unoccupied hours, will not be surprised at this broken-up condition of the vases, but will be astonished that any one should have been able to find a copper axe among them.

The pottery was of three different qualities, like that of the neolithic station of Alba[2] in Upper Italy. Fragments of

[1] Weight, 62 grammes; thickness in the centre, 7 millimetres; length, 65 millimetres; the straight blade, 35 millimetres. Slightly concave at the heel. The axes of stone and this of copper are now in the Museum of Taranto.

[2] Traverso, *Stazione neolitica di Alba*, ii. p. 56, 1901.

pottery of a red-brown colour outside were very abundant, and there were pieces of large vases which were 15 millimetres thick with rough surface. Others of globular form with a diameter of about 20 centimetres are of black earthenware. The surface even of the broken parts is covered with a thin stratum, the colour of tobacco, deposited by the infiltration of water. The thinner and finer vases have the surface polished with the spatula.

FIG. 183.—FLAT AXES OF COPPER, MUSEUM OF LECCE.

Some basins, with projecting foot, are of good red clay. This finer clay sometimes takes a reddish-yellow colour ; some conical vases have a diameter of 20 centimetres at the mouth and are 15 millimetres thick with flat base. Besides small globular vases, 5 millimetres thick, two forms of basin can be distinguished, semi-conical and semi-globose ; the latter have the lip slightly everted.

Two kinds of handle were found, one formed of a

rectangular strip with blunt edges, the other with a semicircular projection put on a little below the edge; both these forms were found in the pottery of the dolmens. On the smooth earthenware the only ornament was the cord, which passed round the body of the vase, or at the mouth, where little holes had been made either with the fingers or with a wooden cylinder, which had been pressed on vertically while the cord was still soft. In the excavation of these deposits we find the first introduction of copper arms among a people who had till then only used stone weapons. Two other facts may also be observed: the resemblance of the pottery of the Place of the Wolf with the pottery of the dolmens found at no great distance, and the relation of the technique of these vases with those of the neolithic settlements of Northern Italy, and especially with those of the station of Alba in Piedmont.

The Museum of Syracuse possesses a collection of flat axes, some of which are of copper. One of them is reproduced in Chapter III., Fig. 27. There are other copper axes in the Museum of Leece, and I illustrate them (Fig. 183), one-third less than the actual size. These are, however, of less importance, being objects acquired without knowledge of the conditions of their discovery.

2. THE NECROPOLIS OF REMEDELLO

The necropolis of Remedello, in the Bresciano district, contained a hundred tombs which give us an idea of the surroundings in which the inhabitants of Northern Italy were living at the time when copper weapons first came into use. By the skeletons were flint arrow-heads, sometimes eighteen or twenty, arranged in order as if the quiver had been placed in the grave. The stone axes are polished, and were found with pierced hammer-heads and almond-shaped flint daggers finely worked. The impression of the cloth of the period has been left on the patina of a dagger (Fig. 184). The great abundance of copper weapons in Tuscany and Umbria proves that agri-

culture must have been flourishing and the people rich. Taking into account the price of metal, considerable exchange of provisions would be required to enable so great a stock of copper to be acquired as that which has escaped the destruction of so many thousand years.

Small rectangular or elliptical scales cut out from shells, and with two holes to sew them on by, were fastened on dresses for ornament. One tomb contained a hundred and fourteen, which had probably been fastened on the surface of a belt, which was worn across the right shoulder and passed to the left side; the hand of the skeleton was resting on his dagger. Around the body, as in the Egyptian tombs of the neolithic period and in the age of copper, were vases both great and small, in conformity with the religious concepts of the neolithic age, which prescribed the placing near the body of all that the dead man could need in the life beyond the grave.[1]

For the sake of brevity I will take into consideration only Upper Italy and Etruria, and we shall find what we could hardly expect, *i.e.*, that the age of copper is now better known than the bronze age which follows it. It is a fundamental problem of Mediterranean history, whether at the end of the stone age relations were established between the Italians and other peoples who were acquainted with copper only; or if, on the other hand, the Italians of the North came at once in contact with people who

[1] The tombs of Remedello have been illustrated in Professor Colini's memorable work (*Bullett. paletn. ital.*, 1898, xxiv. *et seq.*). Here I shall only mention the arms as the part most interesting to us on account of the connection with the Aegean. I have to thank Professor Alessio Alessi, Director of the Chemical Laboratory of the R. Istituto Tecnico di Reggio Emilia, for the following analyses of copper arms from the Chierici Museum at Reggio Emilia. The first account of the tombs of Remedello was published by Professor Chierici in 1884. Regular excavations were made later at two periods under the superintendence of Professor Chierici, and some of the tombs were removed to Reggio Emilia where, as we may say without exaggeration, we can now study neolithic civilisation better than anywhere else, as besides the valuable material we can also make use of the account of it written by Professors Chierici and Strobel, two eminent authorities on the subject of palæethnology.

were already in possession of tin, and therefore also of bronze. The facts which I shall set forth in this chapter will demonstrate the existence of an age of copper, and we have to decide whether there was a migration of the people; that is, an invasion by a new race bringing bronze into Italy, or if the penetration and diffusion of copper and bronze was simply the effect of commercial exchange. From what I have already set forth, the greater weight should apparently be given to the evidence on the commercial side of the question, for it would seem more in accordance with fact that commercial exchanges between Italy and the Isles of the Aegean should have been initiated

FIG. 184.—COPPER DAGGER FROM THE TOMBS OF REMEDELLO.

FIG. 185.—SMALL COPPER DAGGER, REMEDELLO.

in the Minoan age, rather than that copper and bronze should have been brought in by an invasion from Central Europe, for the Cretans were, as we know, a sufficiently enterprising race to have carried into Italy the superfluous portion of the copper produced in their country.

3. COPPER WEAPONS DISCOVERED AT REMEDELLO

In a tomb at Remedello (No. V.) the skeleton of a man was found who appeared to have been buried in a kneeling position, for in digging down from above, when a depth of 1·20 metres was reached, first the skull was perceived, then the ribs, and by degrees all the rest, so that it was seen that he was crouching down upon his knees. The triangular copper dagger (Fig. 185) found in the tomb is 75 millimetres long, and weighs 51 grammes. The tang is rounded, and has five holes for the rivets. The shape of the blade is identical with that from Crete, and with other copper daggers discovered in the terremare and palafitte.

In the tomb No. LXXXIII. is the skeleton of an adult with the legs violently bent up and the left arm resting across the breast, so that the hand reaches the right shoulder. The right arm lies along the body with the hand slightly bent and touching a triangular dagger (Fig. 184), flat, or without a rib, and with a short tang with a hole bored through it.[1] At the base of the dagger traces of the handle may be observed in the different coloration of the patina, from which we see that the handle projected 2 or 3 millimetres beyond the tang, and terminated in a straight line. The handle was attached by three small copper rivets disposed in a triangle. At the extremity of each of these rivets a conical cap, also of copper, having a diameter of about 15 millimetres, is fixed by being beaten down. The terracotta figure discovered at Petsofà,[2] in Crete, by Dr. Dawkins (Fig. 186), will show the form of the handle of this dagger. It was flat, like that of the dagger worn at the girdle of this statuette; this is seen also from the arrangement of the rivets. Dr. Strobel concluded that the haft was triangular. This is the case also in the statuette, but instead of a large boss at the extremity there is an oval, squat pommel, as in the preceding statuette (Fig. 65). The sight of this figure wearing a dagger, with the blade of the same

[1] Total length, 190 millimetres; width at the base, 59 millimetres; weight, 80 grammes.

[2] Dawkins, *Annual of the British School at Athens*, ix. 1902.

FIG. 186.—TERRACOTTA FIGURE DISCOVERED AT PETSOFÀ BY DR. DAWKINS.

length and shape as this from Remedello, and an identical handle with the same capped rivets for fastening the pommel placed in the same position at the edge of the handle, gives some reason to think that this same weapon was used both in Crete and in Italy.

In the tomb LXII. with the skeleton of an adult was found a flat axe of copper (Fig. 187), 60 millimetres in length, similar to that which I found at the Piazza di Lupo, near Taranto, and to another small one at Lecce (Fig. 183); this also has the head square without an incision in the centre, and widens a little at the cutting edge. A triangular copper dagger (Fig. 188), 24·5 centimetres in length, is strengthened by a rounded rib down the centre; near the handle are three bosses, also of copper, with conical cap, as in the preceding cases. The cutting edge is not straight, but displays a slight concavity — the characteristic curve of the primitive Cretan weapons. The flint daggers which were found in each of these tombs have, on the other hand, the cutting edge of the blade convex. These copper daggers are therefore not a copy of the neolithic dagger, but in the square shape of the tang and by the concavity of the edge of the blade resemble the daggers of Crete. A flat copper axe was found with the edges slightly flanged,[1] and also part of the handle of an axe cut out of a stag's horn.

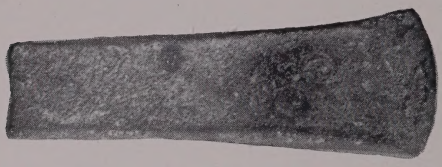


FIG. 187.—SMALL COPPER AXE, REMEDELLO.

In all, 117 tombs were opened in the necropolis of Remedello, and no object of bronze was discovered in any of them. About two hundred more had been disturbed and upset by agricultural work, but no bronze arms were found.

The copper axe (Fig. 189, rather less than the actual size), 195 millimetres in length, was discovered in a deposit at Coviolo

[1] Eighty-six millimetres in length; width at the cutting edge, 30 millimetres; at the heel, 18 millimetres; 8 millimetres thick.

della Baragalla. The heel has a slight sinuosity in the middle, a

FIG. 188.—COPPER DAGGER, FROM THE NECROPOLIS OF REMEDELLO.

FIG. 189.—COPPER AXE WITH FLANGED EDGES, FROM THE DEPOSIT OF COVIOLO.

slight indication of the semi-lunar incision, for the better fixing

of the axe into the handle. There were altogether seven axes and two moulds for casting, which proves that the casting of copper weapons was practised here.

The axe from Coviolo, which is much longer than the copper axes of primitive type, is of importance in the study of prehistoric metallurgy. With its flanged edges and the cavity in the heel, it represents the type of axe characteristic of Italy.[1] That it is of copper proves that the age of copper lasted long enough in Italy to be able to create a special characteristic type of axe, which was diffused later on beyond the Alps.

4. COPPER ARMS FROM LAKE THRASYMENE

In 1897 a skeleton was discovered in a tomb on the hill east of Lake Thrasymene, in the commune of Pozzuolo.[2] Beside the bones were five flints, or arrow-heads (Fig. 190, A, B, C, D, E), with a small dagger (F), a long knife (G), and a small flat axe (H). All these later metallic objects are of copper. I have not analysed them, but they look like copper. The arrow-heads, with straight outlines and sharp points, are perfectly made and finished off with most minute touches. Three are of white flint, two of pinkish flint, all have the tang, and are of graceful form. Their resemblance with the arrow-heads from Remedello, both in variety of flint and in shape and quality of the work, is such that if they were all mixed it would be impossible to distinguish one set from the other. The small flat copper axe (Fig. 190, H) is identical with that which I found at Piazza di Lupo, near Statte, and with those from Sicily and from Lecce.

The small dagger (Fig. 190, F), 6 millimetres in length, resembles in shape the flint knives found in the tombs of Remedello, and has three holes at the base. One large knife-blade of

[1] Montelius, *Die Chronologie der ältesten Bronzezeit*, p. 103.

[2] I have to thank Comm. Gamurrini, Director of the Museum of Arezzo, for permission to publish the contents of this tomb. Professor Colini describes the contents of a tomb of the neolithic age similar to this, and that material is also in the Museum of Arezzo (Colini, *Bullett. paletn. ital.*, xxvi. 1900, p. 133).

FIG. 190.—COPPER WEAPONS DISCOVERED IN A TOMB AT POZZUOLO, NEAR LAKE THRASYMENE.

oval shape (Fig. 190, G) is shown two-thirds of the actual size; in the rounded base are three bent rivets in place, which have served to fix on the handle. The edges of the blade are straight.

The small copper axes from Piazza di Lupo and Lecce, those found in the tombs of Remedello, in the Viterbo district, and this (Fig. 190, H) from the tomb of Lake Thrasymene, are so small that the question as to what they were used for at once presents itself. We cannot suppose that they were votive weapons, for they were found near the skeleton, and we must believe that they were for personal use. They are too small and too light to be used as weapons of offence; we must conclude them to be tools, and, judging from the well-preserved blades, we might suppose that these little axes were used for cutting wood. They have certainly not been used for cutting stone, or the blades would not be in such good condition. Rather than allow that these small axes have been tools from a carpenter's workshop, we are inclined to admit, with Professor Colini and others, that these little axes may have been simply a distinguishing mark and a sign of authority.

The close resemblance between the tombs of Remedello and that of Lake Thrasymene proves that there was a time at the end of the stone age during which Upper and Central Italy were under the same conditions of culture. This uniformity is an important thing, which must be clearly established that we may understand the condition of civilisation in the Peninsula and in the islands at the close of the stone age.

The private collection of my friend, Giuseppe Bellucci, professor in the University of Perugia, contains seventy-two flat axes of copper. This prehistoric material, collected in the restricted field of a few provinces of Etruria and its boundaries—that is, in the country round Perugia, along the Apennines as far as Aquila and Ascoli, for a length of less than 100 kilometres—may give a rough idea of the plentifulness of copper axes. If so many axes have been saved from destruction during several thousand years from the time when objects of copper were melted down to be transfused into bronze, we can imagine

how incomparably greater was their number from the end of the neolithic age to the bronze age in this region. This is an argument in favour of the opinion that, with certain reservations, the age of copper must have lasted for several centuries. The abundance of copper objects in Etruria impresses us with the fact that in the stone age these districts must have been rich to be able to procure so great a quantity of metal, and that they were densely populated.

5. CHANGE IN THE SHAPE OF AXES DURING THE AGE OF COPPER

That the time during which the Italians were unacquainted with bronze and used only copper lasted for several centuries may be argued from the change in the form of the copper axes. In Chapter VII. I stated that the simplest implement of the stone age was a sharpened flint which had a sharp edge given to it on one side, and was tied to a handle. The most ancient and most simple copper axes imitated these flints, and the section of one of them represents an ellipse, while in the longer form it is like a cone. Later on the stone axe was worked on a millstone so as to reduce it to a quadrangular or trapezoid form, and even the copper axes imitated them ; they were made thinner and widened somewhat at the cutting part, but kept narrower at the handle end.

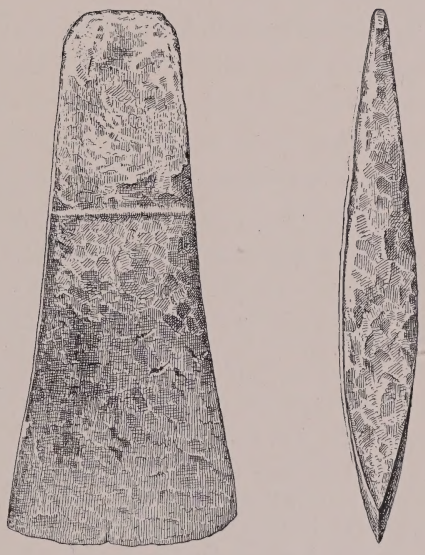


FIG. 191.—FLAT AXE OF COPPER DISCOVERED AT MARSCIANO, NEAR PERUGIA. HALF SIZE.

I give an example of these axes (Fig. 191). A farmer, while

working in the fields at Marsciano, near Perugia, discovered a trench containing a skeleton which had been interred in the bare earth with almost all the characteristic industrial products of the neolithic period [1]—a dagger of red flint, 185 millimetres in length, finely worked with a heart-shaped tang ; four quivers of triangular arrow-heads with tang ; a stone hammer with perforation ; a small triangular blade like the daggers of Haghia Triada, also of copper,[2] of the same form and dimensions with rounded base.

The axe, Fig. 191, belongs to one of the most archaic types.[3]

In the last place appear the copper axes with the edges flanged (Fig. 189), and cast with a sort of lateral border, which serves to fix the axe more firmly to the handle. The diffusion of the flat axes and of those with flanged edges from one end of Italy to the other, proves that the copper age must have been very long. It takes a long time to change the shape of a tool ; but that such a change should extend from one end of the peninsula to the other must be admitted to require a very long

[1] The objects from this tomb, now in the Museum of Bologna, have been illustrated by Professor E. Brizio in *Atti dell' Accademia dei Lincei*, 1899, August, p. 287 ; and by Professor Colini (*Bull. di paletn. ital.*, xxiv. 1898, p. 238).

[2] I have to thank the late Professor Brizio for allowing me to analyse the metal of this axe.

[3] The analysis gave the following results : Copper 99·700, tin 0·079 per cent. This is the second type of axe according to Professor Colini's classification (*Bullett. paletn. ital.*, xxvi. 1900, p. 232), to whom I refer for the bibliography. The third type has trapezoidal, or nearly rectangular, edges (according to Colini), with the sharp edge less curved but more expansive than the former, with the base rectilinear or with rounded corners. To this type belongs a copper axe found by Dr. Paolo Lioy in the Lake of Fimon (*Mem. R. Instit. Veneto*, xiv. 1876, Plate XIX.), and this one also, writes Dr. Lioy, is of copper. The fourth class is characterised by straight, almost parallel sides, and by the expansion of the sharpened edge, which projects beyond the sides and forms an angle with them. Such are the axes of Remedello, of the Viterbo district, of Lake Thrasymene and of Sicily, of which I have published illustrations. The fifth type has the body relatively narrow, diminishing regularly towards the heel, and widening to a semicircle at the cutting edge. In a sixth division Professor Colini groups the axes with flat face and straight base and with sides straight and parallel in the upper part, but hollowed lower down to form the semi-lunar sharpened edge.

time. Dr. Much's statistics are important in this respect, for having collected all over Europe the data of a hundred and ten finds (not including the latest excavations in Italy), he shows that only in forty-four cases were arms of stone, copper, and bronze found together. Judging by this we must admit that bronze was only introduced slowly, especially when we see that in many tombs, as at Remedello and elsewhere, no bronze is found at the end of the neolithic age after copper had already come into use.[1] The length of the copper age in Italy is shown by the above recorded changes in the form of the axes. In fact the decided flanging of their edges was an invention which required many centuries of diligent study and experience. For the wings and flanged edges not only serve for fixing the handle firmly, but also render the structure of the axe more solid, though a smaller quantity of metal is required. The T-shaped irons which are now coming into vogue again are a repetition of this same principle which was first applied when the edges of the axes were raised. And every one knows that iron bars, even if thin, break much less easily if they have the edge turned up at right angles. It was only after this invention that the quantity of metal could be diminished and axes could be made thin and narrow at the heel. Copper axes which bend beneath heavy blows became rigid when their edges were flanged suitably. But a very long time would be required before this invention could spread from one end of the peninsula to the other; and such must have been the duration of copper in Italy.

6. COPPER WEAPONS IN THE TERREMARE

When copper first came into use it was not possible all at once to substitute metal for stone in the case of arms and utensils; the same thing happened in the case of copper after the invention of bronze, and the terremare, though belonging to the bronze age, contain objects made of copper. I was able to assure myself of this fact by numerous analyses which I was allowed to make on

[1] Much, *Die Kupferzeit in Europa*, p. 230.

the arms in the Museum of Modena, which, containing as it does the produce of the excavation of a great number of terremare, is through the variety of its collections one of the most important for the study of palæethnology.[1] Ever since 1883 Professor Pigorini has asserted that there is a close relationship between the arms of the terremare and those of the Aegean,[2] and this original idea has been confirmed by fresh evidence.

Fig. 192 represents three copper daggers (A, B, C), and they are similar to the copper dagger (Fig. 184) of the period of the

FIG. 192.—COPPER DAGGERS FROM THE TERRAMARA OF MONTALE.

hut foundations discovered at Remedello. Fig. 192, D, is a bronze dagger found in the palafitta Virginia in Lake Varese. The presence of this form of dagger on the hut foundations, together with stone weapons, as well as in the palafitte, shows that it is a primitive weapon belonging to the close of the neolithic age, and its resemblance with the arms of Crete shows that it is of Aegean origin. The illustrations are of the

[1] My best thanks are due to the Municipality of Modena for their liberal and unconditional help in my analyses.

[2] *Bullett. paletn. ital.*, ix. 1883, pp. 83, 84.

actual size. The dagger of Fig. 192, A, is the shortest; it is from the terramara of Montale, is scarcely 47 millimetres in length, and has two beaten-down and much oxydised rivets through the blade. The rivets are about 1 centimetre long and probably fastened on a bone handle. The dagger B is a little longer and somewhat incomplete as to the blade, where two rivets with large caps have served to fix the handle. It was found in the terramara of Casinalbo. The dagger C, with the point broken, was found in the terramara of Montale. The bronze one (Fig. 192, D), which was found in the palafitta at Isola Virginia in Lake Varese, has three rivets instead of two; but the mode of boring the edge of the blade is the same and is characteristic of Cretan daggers. The form of these four blades, and of others like them which are in the Museum of Modena, is similar to that of the daggers from Crete. The beaten-down copper rivets, like those of the so-called twin buttons which we see in these daggers, have come to light, as I have already said, in other parts of Northern Italy.

FIG. 192, D.—BRONZE DAGGER FROM LAKE VARESE.

As these daggers are numerous in the Museum of Modena, I was allowed to make a chemical analysis of one, and found that it was of pure copper. Similar knives exist in various parts of Italy and even in Sicily, which shows that the short, triangular daggers had spread all over the Continent and upon the islands, and we have no reason to suppose that these from the palafitte and terremare are of greater antiquity than those of Haghia Triada and Kumasa, but rather the reverse.

Travellers in the eighteenth and nineteenth centuries who penetrated into countries whose inhabitants had not yet been in contact with Europeans, carried with them Venetian glass beads, calico, and copper wire with which the savages made themselves

ear-rings, bracelets, and necklaces. The same thing happened in the case of the first traders who introduced copper to the neolithic populations in Europe. In Silesia, for example, there are tombs in which there are no copper weapons, and this metal was used only for pins, rings, and bracelets.[1]

Copper was a precious metal, and was at first used only for objects of ornament; it was only at a later date that it was used for arms, daggers, axes, scythes, and tools.

[1] Seger, *Archiv. für Anthrop.*, v. 1906.

CHAPTER XXII

THE TRACES OF MINOAN RELIGION IN ITALY

I. THE MINOAN SANCTUARY OF CANNATELLO, NEAR GIRGENTI

"The Cretans say that the honours rendered to the gods, the sacrifices and mysteries of religion are of Cretan origin, and other nations took them from them. Demeter passed from the Isle of Crete into Attica, then into Sicily, and thence into Egypt, carrying with her the cultivation of corn." [1]

I GAVE up my researches in the laboratory and interrupted my beloved studies because the doctors ordered me to spend the winter in the South, to change my occupation and to live in the sun. When I commenced this new life of excavation I had no idea of experiencing such beneficial and life-giving emotion. I think that the pages I am now writing will be of use, and the hours that I have spent in excavating in Crete, in Sicily, and Southern Italy are among the pleasantest of my life. At Cannatello, near Girgenti, I discovered a Minoan sanctuary [2] like that in the primitive palace of Phæstos, described by Dr. Pernier. It was in the midst of almond-trees in blossom facing the sea, among the golden oranges; and all nature smiled as if to encourage me in my work. My labourers were content, and sang as they dug in the black earth, collecting the vases of the folk who had lived before them on the hills of Cannatello, and rivalled each other in bringing them to me.

I had discovered a sacred place among the hut foundations

[1] Diodoros, v. 77.

[2] *Monumenti Antichi*, xviii. 1908, p. 640.

within a prehistoric village; the libation table was in its place upon a layer of gravel and brown pebbles taken from the neighbouring river. Just so round the *Lapis Niger*[1] in the Roman Forum was the river sand from Ponte Molle found spread upon a little stratum of charcoal and put there with the object of purification after the Gauls had destroyed the tomb of Romulus. The astragali, so common in the neolithic soil of Crete, were here, too, in the sanctuary. Near the *Lapis Niger* came to light 164 astragali, all of sheep, nineteen of which had a hole bored through them, thirty-one are intentionally polished. I remembered that a similar collection of ovine astragali from Megara Hyblæa is preserved in the Museum of Syracuse, and I had seen another in the Museum of Lecce. Several of the astragali of the Roman Forum are green through coming in contact with a wire or some object of bronze, and in the same way some of the astragali in the Museum of Syracuse are green also.

Near the sanctuary another pavement of beaten earth in three strata, of which the uppermost was of chalk, recalled to my mind the cell of the priestesses who performed the rites of Minoan religion as in the sanctuaries of Phæstos and Knossos, where there are three rooms together. I found the pestles, too, with which the priestesses pounded the colours to paint themselves with, and round about were the votive horns and fragments of precious vases of shining black clay.

During the resurrection of this sanctuary I thought of the strife of human thought when the Minoan navigators landed on the shores of Sicily with other rites, other beliefs, adoring the mystery of truth and preaching the origin of life, the cult of nature and the religion of Ge, mother of the gods. The reader will understand (without my own confession) that I am an enthusiast on the subject of Minoan religion. No other religion of Antiquity rose to greater heights in the realm of mental abstraction, no people ever had, so far as we know, before the days of Minos, a more ideal or a purer religion. No temples,

[1] Boni, "Notizie degli Scavi," *R. Accad. Lincei*, 1899, p. 153.

no fetishes, no anthropomorphism, no animal worship.[1] Upon mountains and in caves the mystery of fecund nature was contemplated, and religion was inspired by beauty. The priestesses were women ; and what supremacy, what grace and refinement was that of the Cretan women may be seen in the frescoes of Knossos, which illustrate the most glorious pages of woman in antiquity.

The independence of the Minoan religion from the religion of Egypt is one of the glories of Mediterranean civilisation. The domestic cult of the penates and the absence of a dominant sacerdotal caste are two other characteristics of Minoan civilisation. The later forms of religion were less ideal, and passed from the cult of nature and beauty to that of man-like divinities, with the childish and impure fables of mythology, till they were finally enclosed within the narrow bounds of morality. The Minoan religion with its faiths brought to these altars a highly developed conscience and a fertile diligence in work. This humble shrine represents one of the links which united Italy to the central hearth of Mediterranean civilisation.

2. THE HORNS OF CONSECRATION[2]

Dr. Evans has shown in his works[3] that the *horns of consecration* had an important part in the Mycenæan cult. They were represented by a pair of horns joined upon a base which was movable, several of them being often placed near together. Some of these horns, like those at Palaikastro,[4] are only a few centimetres in height. When Dr. Keller and Dr. Chantre first

[1] Karo, "Altkretische Kultstätten," *Archiv für Religionswissenschaft*, vii. pp. 117. 155.

[2] *Palaces of Crete*, p. 194, Fig. 85, five sacred horns are shown, two above at the foot of the columns and two below at the base of the columns ; also in Fig. 86, p. 195, three pairs of horns of consecration are shown in the upper part of the illustration.

[3] Evans, "Mycenæan Tree and Pillar Cult," *Journal of Hellenic Studies*, xxi. 1901, p. 136.

[4] Bosanquet, "Excavations at Palaikastro," *Annual of the British School at Athens*, ix. 1902, p. 280.

discovered similar objects in the palafitte of Switzerland and Savoy they took them for images of the moon.[1]

In Italy the horns of Golasecca, which are in the best preservation, were described by Professor Castelfranco, who supposed them to be head-rests.[2]

Others were discovered at Bologna by Professor Zanoni,[3] Professor Prosdocimi;[4] and Professor Alfonsi[5] described as andirons several pieces of pottery in this form from the Euganean Hills, but these also are horns of consecration, as may be argued from their form, and especially by the decoration of meanders upon both faces and by the cords identical with those which are observed upon the Minoan horns of consecration.[6] There is a trace of the horns of consecration in Semitic religion, as Dr. Evans has observed, and the latest reflection of the Biblical use is probably found in the name of the two sides of the Christian altar—the horn of the Epistle and the horn of the Gospel.

Dr. L. Siret[7] discovered in a village of the bronze age at Almeria, in Spain, an altar of Minoan form with two horns at the extremities, and at 50 centimetres from it, against the same wall, fragments of another similar altar. When Dr. Siret made this discovery Dr. Evans's work was not yet published; but we now know that this form of altar is Minoan, and it was a matter of ritual to place several of these horns near the Cretan altars, as may be seen in the illustrations of my book.

Horns of consecration were also found in Sardinia, and La

[1] The bibliography is given in two recent works of Dr. Paribene's, "Corni di consacrazione nella prima età del ferro Europea," *Bullett. paletn. ital.*, xxx. 1904, p. 394, and Déchelette, "Croissants lacustres et cornes sacrées," *La Révue préhistorique*, 1908, p. 300.

[2] *Bullett. paletn. ital.*, xxx. Plate V. p. 72.

[3] Zanoni, *Arcaiche Abitazioni di Bologna*, 1893, Plate XIV.

[4] *Bullett. paletn. ital.*, xiii. 1887, Plate VII. 15, 16, 17; Plate VIII. 32, p. 167.

[5] *Bullett. paletn. ital.*, xxvii. 1901, Plate X.

[6] Dr. Hoernes describes those found in different parts of Italy by the name of *Mondbilder* (images of the moon) (Hoernes, *Urgeschichte der bildenden Kunst*, p. 503).

[7] L. Siret, *L'Espagne préhistorique*, p. 70.

Marmora describes a bronze object with two horns, now in the Museum of Cagliari,[1] which bore incised designs similar to those of Mycenæan origin in the temple of Gozo. Another, from the Balearic Islands, has also been described by La Marmora.[2]

The great monoliths of Sardinia, similar to the menhirs, the conical stones of Tamuli with sculptured mammæ,[3] the tombs of the giants of construction similar to the dolmens, have so great a resemblance to the prehistoric monuments of France and the British Isles that they show that Sardinia, as well as Spain, was on the route of the early navigators who travelled from the Aegean and from Africa to the North. The amber found in the tombs of Spain of the period corresponding to the commencement of the age of copper and bronze confirms the theory that the Minoan metallurgists, on their journey to the Cassiterides Islands in search of tin, diffused the knowledge of bronze and brought back amber. Recent studies on Spain have brought to our knowledge the Mycenæan pottery which has been found in many parts of the Iberian peninsula. The publication of Professor Paris,[4] together with what I have already said, and what I shall add in Chapter XXIV. on the subject of prehistoric silver, gives us reason to conclude that Iberian civilisation was developed under the influence of the navigators from the Isles of the Aegean. All that has been written upon the influence of the Iberians must therefore be accepted with caution; remembering that the landing of Minoan navigators on the coasts of Spain is a known fact, while we have no safe evidence of the influence of Spain upon Italy and Sicily in prehistoric times.

3. "EX VOTOS"

In the palace of Phæstos Dr. L. Pernier found, near a pillar of gypsum in the form of a truncated pyramid, marking a cultus

[1] A. de La Marmora, *Voyage en Sardaigne*, 1840, 2e partie, p. 330, Plate XXX. 150.

[2] Ibid., p. 533, Plate XXXIX. Fig. 4.

[3] Ibid., p. 12.

[4] P. Paris, *Essai sur l'Art et l'Industrie de l'Espagne primitive*, 1903.

site, nine double-headed axes of bronze and a small ingot of lead.[1] The axes were arranged one upon another, showed no signs of use, and are of various sizes.[2] This discovery of Dr. Pernier's throws new light on the question of the repositories, for it had been believed that this rite had been brought into Italy by the people who built the palafitte. Above sixty of these repositories are known in Italy, and fresh ones come to light every year. Only a few days ago Professor Orsi discovered a great repository with colossal lance-heads in Sicily. Another repository has been discovered in a terramara at Savignano, on the Panaro, and this contained ninety-six axes, one of which I have analysed.[3]

In my paper on the most ancient arms of copper and bronze I described a repository of votive objects belonging to the earliest period of the bronze age, found within the city of Milan, and I gave illustrations of some objects of which I had been able to make a chemical analysis ; the remainder have been described by Professor Castelfranco.[4] This custom of offering weapons to the divinity seems to have existed from the neolithic period, as the discovery of Dr. Dawkins at Palaikastro proves.[5] In fact, thirty-six stone axes were found at Magasà in a restricted space, nineteen of them being heaped up against a wall. They are axes which have been polished only on one side, like those shown in Chapter IV. (Fig. 54). Upon a surface of scarcely 10 square metres thirty-six axes would seem too many for a simple dwelling-house, and it is allowable to suppose that they must have been for some purpose which I conclude to have been religious.

[1] *Monumenti Antichi*, xii. p. 69.

[2] The illustrations were reproduced in *Monumenti Antichi*, vol. xiv. p. 463.

[3] These repositories are numerous in Northern Europe, and specially in Denmark, where they were studied in 1866 by Dr. Worsaae (*Mémoires de la Société des Antiquaires du Nord*, 1878, p. 241 ; Ibid., Sophus Müller, 1887, p. 225, who considers them as a collection of bronze objects made for a religious purpose).

[4] *Bullett. paletn. ital.*, 1908, p. 91.

[5] Dawkins, "Excavations at Palaikastro," *A. B. S. A.*, xi. p. 258.

4. BROKEN WEAPONS

We have another proof of the influence of Egyptian religion upon the beliefs of the Italic peoples in the broken weapons which abound in our museums. At first they were considered by Professor De Rossi [1] as money values, and there is in the prehistoric Museum of Rome a rich collection of these stones from various parts of Italy. A very fine hoard, found near Narni, consists of two hundred objects with many broken weapons. The idea that these broken weapons and the pieces of copper served as money was opposed by Professor Gamurrini,[2] and now every one agrees that these repositories were not casters' shops but sacred repositories, in the formation of which every offering had its value, being of copper or bronze. Professor Pigorini attributed special importance to the fact that the moulds for casting which are found in these repositories, either whole or broken, are always of bronze, although casting moulds of stone have often been found, which can be attributed to the various periods to which these repositories belong.[3]

The discovery of the great repository of Bologna, containing bronze objects of the cumulative weight of 1418 kilogrammes, not including the fibulæ ornamented with amber, glass, or bone, all intact, convinces us that these repositories are not the magazine of a foundry.

Broken weapons are not found in the Cretan tombs. The tombs of Knossos, excavated at Zafer Papoura by Dr. Evans, show this clearly, these objects, therefore, were not for funeral use, but a gift and an offering for the cult which the priests

[1] De Rossi, "Trésor monétaire de bronzes primitifs trouvé près de Narni," *Congrès intern. d'Anthropologie et d'Archéologie*, Bologna, 1871, p. 457.

[2] *Bullett. paletn. ital.*, 1892, p. 109.

[3] In 1876 the Ing. A. Zannoni discovered within the city of Bologna under a stratum of charcoal a great vat containing 14,000 objects of bronze with very large copper ingots for casting—arrow-points and spear-heads, knives, fibulæ, chisels, &c. In accordance with the ideas of that day, this repository was supposed to be the workshop of a coppersmith with provision of metal for casting (*La fonderia di Bologna*, 1888).

collected together in sacred places. At this period the double axes began to be broken both in Crete and Mycenæ. This

FIG. 193.—DOUBLE AXE OF BRONZE, INTENTIONALLY BROKEN, FOUND AT SELAKANO, CRETE.

statement can be proved by the material collected by me, of which I have made a chemical analysis. Fig. 193 shows a bronze

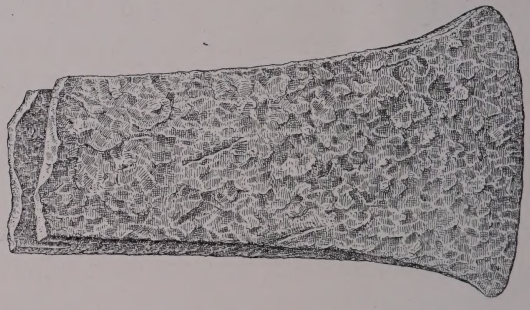


FIG. 194.—DOUBLE AXE OF BRONZE, BROKEN INTENTIONALLY, FOUND AT MYCENÆ.

double-headed axe, rather less than the actual size, discovered at Selakano, in Crete, which has been broken. That it was intentionally broken can be seen from its good state of preservation and from the blade with the well-sharpened cutting edge. The marks of the blows by which it has been broken are visible

near the opening through which the handle would be fixed.[1] Another double axe was found broken at Mycenæ (Fig. 194), and of this also, thanks to Dr. Staïs, Director of the Museum of Athens, I was able to make an analysis. It has been broken intentionally like the other, and it is evident from the cutting edge that it had never been used.[2]

These few notes are sufficient to show that both in Crete and in Greece these deposits of votive objects and of weapons broken in honour of the divinity already existed in the Mycenæan period. Why the weapons and the objects in the repositories were broken we know not, but it is probable that a precious object was sacrificed in the hope of obtaining a favour in return, and for that reason it had to be made useless. Perhaps the vats or cists remained open and exposed to the public, like the treasures preserved in Catholic cathedrals. The soul of the crowd is influenced by example.

5. THE ITALIC RELIGION

In Roman religion the vessels for sacred use were made without the potter's wheel; the fire of the Vestals, if allowed to go out, had to be relighted by rubbing two pieces of wood together; in treaties of alliance, after the text of the treaty had been read, it had to be sealed by the sacrifice of a pig, which had to be killed with a flint knife kept in the temple of Jupiter Feretrius; iron was excluded from all objects used in the cult and bronze only was used; in the Pons Sublicius across the Tiber there must be no metal nails to fasten the planks together. These points mark the connection with the neolithic age, but give no indication as to whether the influence came from the

[1] Another double axe of bronze, smaller and somewhat broken, was found at Psychro. The analysis shows that it was of bronze with 11·376 per cent. of tin. I reproduced the photograph in the *Memoria sulle armi più Antiche*, Plate II. Fig. 4, p. 500.

[2] The analysis shows copper 89·11, tin 8·70, lead 1·70 per cent. This proportion of lead is too large for it to have been naturally in the copper. It has been added intentionally. Possibly in the case of a weapon for votive use the casters may have economised by putting in lead instead of more tin.

North or South. The tree cult, which had a marked place in Roman religion, and the *Ficus ruminalis* have a decisive significance when compared with the Minoan monuments, in which the trees and the fig stand in the *temenos* near the temples and tombs, and it is possible that the cult of the *penates* was developed under the influence of primitive Aegean civilisation.[1]

From these suggestive comparisons might be deduced the existence of prehistoric bonds of union between the two peoples, and the progenitors of the Romans have probably received by older paths the inspiration of the earliest forms of cult. At Phæstos was found the inscription which was placed above the temple of the Great Mother. The cult of Rhea survived till historic times, and Diodorus[2] wrote that the house of Rhea was still to be seen at Knossos near a grove of ancient cypresses. In Sicily a temple of the Mother Goddess, founded by the Cretans, of which Plutarch speaks at length,[3] was in existence in historic times. In it were shown some spears and helmets of copper which were believed to have been hung up there as a gift by Odysseus.

The Greek and Roman religions differed in many points, and we see with surprise that many Minoan elements not met with in the Hellenic religion have passed over into the Latin cult. Besides the cult of the axe, the Latins had also that of the shield. Upon the Minoan seals the shield is often found as a symbol of the divinity, and there is at Mycenæ a painting[4] in which two priestesses stand in the act of adoration on either side of a great shield. Ivory shields, too, of the same form are abundant in the deposits of Knossos. The priests preserved in Rome the Ancilia, or sacred shield of Mars, which seems to have had the same form, 8, of the very ancient Beotian and Mycenæan shield.

The Minoan resemblance is specially apparent in the greater part which the worship of rural nature had in Roman religion in comparison with the Greek mythology, also in the greater

[1] *Vide* the account of the domestic lararium in the *Palaces of Crete*.
[2] V. 66.
[3] *Life of Marcellus*.
[4] Ἐφημερὶς ἀρχαιολογική, 1887, Plate X.

number of divinities in connection with the cult of trees, of fields, and of flocks. We must not forget that the same conditions of life and the constant contact with nature common to the progenitors of the Romans and to the Cretan race may have produced in both analogous forms of cult. We must, however, note this identity without excluding the idea of Aegean influence on the religious concepts, which probably arose somewhat later in our peninsula.

CHAPTER XXIII

AGRICULTURE AND THE FORESTS AT THE CLOSE OF THE NEOLITHIC AGE

I. THE TORBIERE, OR PEAT BOGS

THE lakes of Piedmont and Lombardy were once larger and more numerous than they are now. They were all formed in the glacial period, and are surrounded by the ancient moraines. The smaller lakes became filled with aquatic plants, and the larger ones became smaller; osiers and other plants invaded the shores, and superposing each year a new layer of vegetation, formed the peat bogs, which contain the vestiges of the men who lived in the lower Alps from the neolithic age to the beginning of the bronze age. Italian palæethnology began with a paper by Bartolommeo Gastaldi [1] upon the peat bogs, and the most interesting discoveries were made in the peat bog of Mercurago, not far from Arona.

The trees which had fallen on the shores of the lakes where the peat bogs were being formed were covered by the aquatic plants, which buried them under the roots, leaves, and stems of innumerable generations. The plants have been preserved unaltered, so that they can be recognised, and some of the stems are 50 centimetres in diameter. The birch, pine, walnut, elm, &c., are all found intact, so that their bark, leaves, and fruit are recognisable. In the deep strata of some of the peat bogs the *humus* and the surface of the fields, as they were

[1] B. Gastaldi, *Nuovi Cenni sugli oggetti di alta antichità trovati nelle torbiere e nelle marniere dell' Italia*, Torino, 1862.

cultivated in the neolithic period, can be seen. The dwellings, built on piles, came to light, similar to those still used in some countries. Among the piles driven deep into the mud, weapons of flint and rough ware of blackish clay were found, also the cart-wheels of which models are preserved in the Museum of Turin, and from the bottom of the lake buried by the peat bog a wooden anchor more than a metre in length was extracted, also some oars and a canoe made of the hollowed-out trunk of a tree.

The Lake of Varese and those near it were the centre of a numerous population, if we may judge from the considerable number of pile villages.

On the Island of Varese the tops of the great fir trunks

FIG. 195.—KNIFE FROM THE TERRAMARA OF MONTALE.

which supported the dwellings can still be seen when the level of the lake is lowered through scarcity of water.

At Mercurago a copper knife, shaped like a willow leaf, 15 centimetres in length, was found, and also two bronze pins, 10 or 12 centimetres long, whence we may suppose that these dwellings correspond with the close of the copper age and the beginning of that of bronze.

Dr. Gastaldi thought this knife was the point of a javelin, but it is the blade of a knife. The two rivets are too short to fix it to a spear-shaft, but they are of the right size for a thin bone or wooden handle. In shape it is identical with the knives of the terremare. I show a specimen (Fig. 195) from the terramara of Montale, near Modena. This, however, is of a good blend of bronze, while that from the peat bog of Mercurago is of copper ; [1]

[1] The analysis shows copper 90·20, tin 9·59 per cent.

this shows that the metal-workers when they had tin still kept to the same forms as those of the earlier copper knives.

It is a singular fact that no form of blade characteristic of Italy is so far known, and it may be asserted that the Minoan and Mycenæan civilisations possessed all the types of weapon found in the terremare.

2. AGRICULTURE AT THE CLOSE OF THE NEOLITHIC AGE

In nearly all the peat bogs described by Dr. Gastaldi it was observed that the piles of the palafitte were carbonised at the upper part, while below were the traces of dwellings which had been destroyed by fire. In the palafitte of Switzerland [1] the remains of neolithic grain were found, and amongst the excrement accumulated in the mud naturalists sought for the seeds of the fruits eaten by primitive man, and found there both cherry-stones and plum-stones.

Julius Cæsar described the Germani who lived in a semi-nomad state, and later on Tacitus says in his "Germania" [2]: "When they are not at war they devote some time to hunting. You could not make them plough the earth and wait a year." The populations on both sides of the Alps were, at the close of the neolithic period, more advanced than the Aryans, for the excavations in the palafitte show that they cultivated with ease wheat, barley, rice, and millet, and also beans, lentils, peas, and other leguminous plants. They no longer lived by hunting, but maintained themselves by the produce of their herds and fields and by fishing. The carbonisation of the vegetable remains by the effect of fire was useful in preserving the seeds and fruits, which are easily recognisable from the wrinkles of the dried pulp.

In the neolithic station of Butmir it was possible to study the seeds of the cereals, for many were found slightly carbonised,

[1] Neuweiler, "Die prähistorischen Pflanzenreste Mitteleuropas," *Vierteljahrsschrift der Naturforschenden Gesellschaft in Zürich*, 1895, anno 1, pp. 23–132.

[2] Tacitus, *Germania*, xiv. xv.

possibly not by a fire but roasted for eating. The wheat was of the same species as that found at Hissarlik by Dr. Schliemann.

The pine, the larch, and the fir were common on the lower Alps. Some trees, such as the walnut, may have been more abundant at that time and the fruit may have been used for food, if we may judge by the great number of *Corylus avellana* found in the palafitte of Lake Varese and in the Lake of Fimon, near Vicenza. The oak, elm, and beech were preponderant in the forests, while around in the fields grew the alder, the poplar, and the maple, and on the slopes of the hills flourished the dog-rose, the strawberry, the poppy, and many species of shrub, among which were found both berries and seeds, including the berries of the laurel. The forests were certainly more extensive, the country better watered and the vegetation more luxuriant than at the present day, but there was little difference in the species found. In the terremare Professor Pigorini found the refuse of the acorn at the bottom of the vessels in which they had been cooked ; and there were also chestnuts, which afforded a more palatable food. In the palafitte of Roberhausen large apples were found, proving that apples had long been cultivated in the neolithic period. Pears were also grown, and were less common and less fleshy than the apples. The seeds of the olive were found in the palafitte of Peschiera of the bronze age, and at Mentone in the period before the neolithic.[1]

The different species of flax which were cultivated, the implements for combing the fibres and separating the material most suitable for spinning and making cloth, the innumerable quantity of spindles and the fine needles of bone and stone give us some idea of the home life of the women of those days. Millstones for grinding wheat are numerous, and when we notice that they are the same as those now used by the women of Abyssinia, we can believe that the space of six or seven thousand years is a short space for the human race.

We do not know whether Minos drank wine or beer. This is a subject for the future researches of archæologists. Pliny

[1] Wittmach, *Ethnograph. Zeitschrift*, xv. p. 401.

wrote [1] that the Romans in the time of the kings used only milk for sacrifices, and that Romulus drank milk and not wine, and it surprises us that the founder of Rome should be so different from the heroes of Homer. Romulus was abstemious, not as is now the fashion in the struggle against alcoholism, but only because wine was too expensive, for the Romans began late to cultivate the vine.[2] At that time women were not allowed to drink wine, and men only after the age of thirty. In the Hellas of the Homeric songs even the boys drank wine, and the charming Nausicaa, when she goes out to wash the linen, receives from her mother the provision of wine in a goat-skin, showing that they had a plentiful store of it.

The idea that when the Greek colonists arrived, Southern Italy and Sicily were new lands to spoil was erroneous. The virgin forests had disappeared thousands of years before the land was ploughed, and the country round Mount Etna was reduced to fields and pastures.

Homer said in the Odyssey :—

"Now when we had escaped the Rocks and dread Charybdis and Scylla, thereafter we soon came to the fair island of the god, where were the goodly kine, broad of brow, and the many brave flocks of Helios Hyperion." [3]

In the Minoan age wood was much sought after for building both houses and ships.

3. THE DISTRIBUTION OF FORESTS IN PREHISTORIC TIMES

In my volume "Vita Moderna degli Italiani," I considered the subject of the malaria in the colonies of Magna Grecia. This is a question which should be more thoroughly gone into,

[1] *Nat. Hist.*, xviii. 24. [2] Ibid., xviii. 24.

[3] "Αὐτὰρ ἐπεὶ πέτρας φυγομεν δεινήν τε χάρυβδίν
Σκύλλην τ', αὐτίκ' ἔπειτα θεοῦ ἐς ἀμύμονα νῆσον
ἱκόμεθ' ἔνθα δ' ἔσαν καλαὶ βόες εὐρυμέτωποι,
πολλὰ δὲ ἴφια μῆλ' Ὑπερίονος Ἠελίοιο."

Od. xii. 260–3.

and I hope some one will study the subject of malaria in prehistoric times. I will try here to touch on another aspect of the question and show how the demand in the Minoan period for wood of old growth was, with the deforestation of Sicily, a cause of malaria from the beginning of historic times.

The scarcity of wood of old growth in the Aegean is shown by the boats made of canvas or leather, of which examples were found at Phylakopi, and here the way in which the wood was economised in the framework is plainly seen.[1] Similar canvas boats are used to-day by the torpedo-boats. Leather boats lasted to a late period, and Diodorus alludes to them when he tells how the Phœnicians carried on the trade in tin.[2] The houses were built of wood in Minoan times. Dr. Evans discovered the models of the houses of Knossos.[3] No one would have imagined that the houses of 2000 B.C. would be like modern houses. The designs are so exact that one can measure the diameter of the stones of which the walls are built. They were dwellings on the plan of the Swiss *châlets* with flat roofs. Even in the great palaces only the ground floor was solidly built of masonry ; the rest of the building was often of wood. One can understand that for the architraves, ceiling, and roof wood was more convenient. Bricks there were, but few used them, and as the Germans in the time of Tacitus were still unacquainted with lime and bricks, it will not appear strange that bricks were rare in Crete.

Great trees, of the size of the trunks which we see in the designs of the Minoan houses at Knossos, are now exceptionally rare in Crete. The beams which have been found carbonised within the walls of the palaces of Knossos and Phæstos have been examined by botanists, who find them to be beech, cypress, and conifers, now rare in the island. Even in the time of Thucydides that writer advises that the wood required for building the triremes should be procured from Italy. Greece and the islands

[1] *Excavations at Phylakopi in Melos*, p. 206.

[2] I. v. 22.

[3] See A. Mosso, *Gli Scavi Creta*, Fig. 66.

of the Aegean are too arid to supply the quantity of wood necessary for a civilisation like that of the Aegean, which lasted two thousand years before Homeric times. Nor were the countries to the north in a more favourable condition; for Amyntas, first King of Macedonia, made a treaty with the Chalcidians of Eubea for the exportation of timber.[1]

4. MINOAN NAVIGATORS AND THE TIMBER TRADE

Their maritime power obliged the Cretans for centuries to build a large number of ships, and they, like the Phœnicians[2]

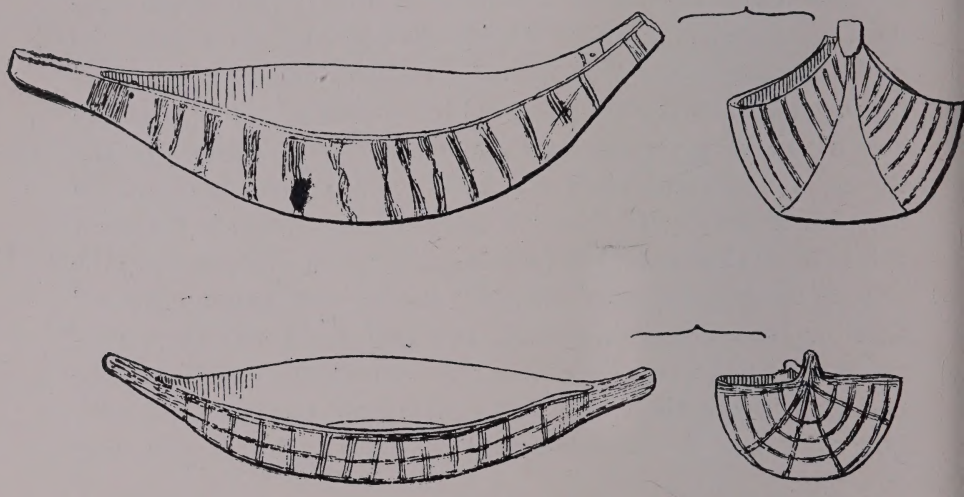


FIG. 196.—EGYPTIAN BOATS OF THE NEOLITHIC AGE BUILT OF OSIERS AND REEDS.

of later days, provided ships for other nations, and carried on trade in timber for the navy. To understand the extent of the timber trade in the Mediterranean during the Minoan age, we must glance at the state of affairs in contemporary Egypt. Here the scarcity of wood is apparent from the neolithic period, as is shown by the boats made simply of osiers, published

[1] Salomon Reinach, *Traité d'Epigraphie grecque*, p. 37.
[2] Ezekiel xxvii. 9.

by Dr. Petrie, Mr. Quibell, and M. de Morgan.[1] These boats, made of osiers and canes bound together, were probably rendered waterproof with pitch and other substances.

I reproduce two illustrations from the work of Dr. Petrie and Mr. Quibell,[2] which show the structure of the vessels of the neolithic age ; they are from two models found in Upper Egypt (Fig. 196).

An alabaster model of a boat made of canes was also found in a tomb of the Ist Dynasty, described by Dr. Flinders Petrie.[3]

On the Egyptian stele in the Museum of Palermo it is written that under Sneferu of the IIIrd Dynasty forty vessels laden with cedar-wood were brought to Egypt. That the timber trade was already in the most ancient times an important matter is shown in the work of Dr. Sethe.[4] We are now speaking of a time fifteen centuries before the Christian Era ; the Minoan thalassocracy had set, and a King of Egypt was sending an expedition to Lebanon to fetch a supply of wood. The Egyptians are represented on the monument as cutting down the cedars.

Deforestation had begun in Italy before Magna Grecia flourished. This destruction of the forests was the cause of the malaria which had already begun to devastate the shores of Sicily before the Hellenic colonies arose ; and the rapid decadence of some of the Greek cities may be attributed to malaria rather than to war.

[1] De Morgan, *Ethnographie préhistorique*, 1897, p. 90.

[2] *Naqada and Ballas*, xxxvi. Fig. 81, *a*, *b*, p. 41.

[3] Petrie, *Abydos*, I. ix.

[4] K. Sethe, "Eine ägyptische Expedition nach dem Libanon im 15 Jahrhundert v. Ch.," *Sitzungsberichte der pruss. Akad. zu Berlin*, 1906, p. 356.

CHAPTER XXIV

PRIMITIVE COMMERCE

I. THE EXCAVATIONS OF MINOA HERACLEA

"MINOS, according to tradition, went to Sicania, or Sicily as it is now called, in search of Dædalus, and there perished by a violent death. After a while the Cretans, warned by some god or other, made a great expedition into Sicania, all except the Polichnites and the Præsians, and besieged Camicus (which in my time belonged to Agrigentum) by the space of five years. At last, however, failing in their efforts to take the place, and unable to carry on the siege any longer from the pressure of hunger, they departed and went their way."[1]

This and many other records which have been left by ancient writers make it impossible to doubt the existence of Minos, and archæology has confirmed history. There are in the Mediterranean region many cities named Minoa, and one of these is in Sicily.[2] The name of Heraclea Minoa attracted me, and I spent above a month in Sicily in search of its site, but without success. It is said to have been situated on a promontory, now called Capo Bianco, between Agrigentum and Selinunte. Hard by runs the river Platani, and here I stayed for some weeks in a deserted

[1] Herodotus, *History*, vii. 170.

[2] They were, perhaps, Cretan trading stations, or cities which took that name in later times as a record of their origin, and it is a sign of noble antiquity. Professor Fick first noted this circumstance when collecting pre-Hellenic names, and we know that names are among the safest indications in history (Fick, *Vorgriechische Ortsnamen*, Göttingen, 1905).

house, near a ruined solfatara. I lived on fish from the Platani and kids' flesh and milk which the shepherds brought me. I carefully observed the banks of the river, for I supposed that the city of Minoa would be away from the sea for safety from pirates. I sought on the hills where the ground seemed to me adapted for building a city, near the water, but I found nothing. Returning to Capo Bianco, where were the walls and ruins of the Greek city which bears the name of Heraclea Minoa, I made, with Professor Salinas, several trenches at various points, but we came upon nothing but the remains of Greek buildings, and to our great surprise we discovered within the hill of Minoa Heraclea a Greek theatre, which will be described by Professor Salinas.

I shall never forget the grand and melancholy poetry of these excavations which we made in the solitudes of this deserted shore, in the midst of blooming asphodels, and with the view only bounded by the blue mountains and the African sea. In the caves which I overhauled there were plenty of stone weapons but no sign of Minoan civilisation. As for the discomforts of the expedition, I will only record that the drinking-water had to be brought from Cattolica, 20 kilometres off, and that not a house was in sight. On this hill, however, where malaria now reigns, there was once a populous city with stupendous walls towards the sea, and handsome dwellings whose marble pavements may be seen among the bushes.

2. LIPARITE

In the Strait of Messina, according to the ancient Homeric legend [1] lived Scylla, "fierce dweller on the ill-famed rock." Odysseus relates how "Scylla meanwhile caught from out my hollow ship six of my company, the hardiest of their hands and the chief in might."

[1] "*τόφρα δέ μοι Σκύλλη κοίλης ἐκ νηὸς ἑταίρους*
ἕξ ἔλεθ', οἳ χερσίν τε βίηφί τε φέρτατοι ἦσαν."
Od. xii. 245–6.

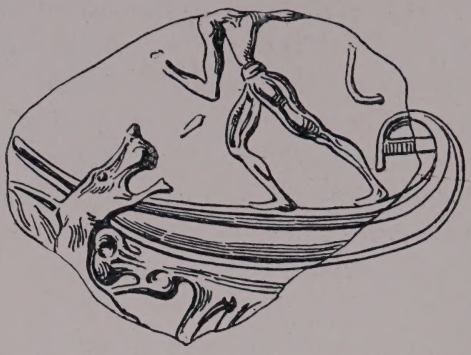


FIG. 197.—MINOAN SEAL WITH THE FIGURE OF A SAILOR AND A MONSTER.

On a seal from Knossos[1] Dr. Evans found a record of this monster. Gelo of Syracuse coined money as a record of his victory on the sea over the Etruscans, and the design has a singular resemblance to this sea monster.[2]

We owe to Dr. Arthur Evans these opportunities for comparison which open new springs in the fields of prehistory, and I am grateful to him for allowing me to reproduce this seal, which forms a comment upon the Odyssey. We admire not only the form of the vessel but also the perfection of the art with which the sailor fighting with the sea monster is drawn (Fig. 197). If Dr. Evans's conjecture is true that this legend of the monster in the strait has been handed down from Minoan times to the historians, we have here the record of a Minoan sailor crossing the strait between Scylla and Charybdis.

FIG. 198.—BLOCK OF LIPARITE FOUND IN THE PALACE OF KNOSSOS.

[1] "Knossos Excavations," 1903, *A. B. S. A.*, ix. p. 58.

[2] Head, *Coinage of Syracuse*, p. 10.

Liparite[1] is not rare in Crete; it is so called because it comes from Lipari, and exists in no other part of the Mediterranean.

Dr. Evans discovered in the palace of Knossos a block of pyramidal form, and allows me to publish the illustration (Fig. 198). It is 43 centimetres in height, and the base is 35 centimetres in breadth. The discovery of this block in the palace, in a room containing the famous frescoes of the Minoan women, proves that it was a precious substance.

3. THE TRITON SHELLS

Professor Mariani[2] has published a Minoan seal on which a woman is sounding the shell of a triton before the sacred horns of an altar. At Palaikastro,[3] and elsewhere, real triton shells were found which had been used for purposes of cult. This rite spread in the Mediterranean region, for eighteen unbroken specimens of the same shell, *Triton nodiferum*, were found by Don Morelli in the Caverna delle Arene Candide, besides two hundred broken ones; and as they all had the apex removed we must conclude that they were sounded like trumpets.[4] Other triton shells were found in the Caverna dei Balzi Rossi, in the Cave of Galuzzo and the Cave of Pollera.

But the most interesting thing is that these shells were made of liparite, alabaster, and marble of natural size, and could not be used to give out a sound, but had probably some votive purpose.

The triton shells are too numerous in the neolithic caves of Liguria for them to have been used for signals; the fact that they are found near human bones gives reason to suppose that even in neolithic times these shells were sounded with a religious signification, as we see on the Minoan seals of Crete. From the

[1] Liparite is a vitreous mass produced at a high temperature, composed of quartz, mica, and felspar, and corresponds to granite among minerals of volcanic formation.

[2] Mariani, *Monumenti Antichi*, vi. 1895, Fig. 12.

[3] Bosanquet, "Palaikastro," *A. B. S. A.*, viii. 296.

[4] N. Morelli, *Resti organici rinvenuti nella Caverna delle Arene Candide*, Genova, 1901, p. 111.

fact that, besides the artificial shells made of liparite, there is in the Museum of Candia one shell made of marble which does not seem to be Cretan, we may conclude that these offerings of artificial shells have been brought by persons returning from sea voyages. I illustrate two views of one of liparite (Fig. 199, A, B), 22 centimetres in height, discovered at Haghia Triada by the Italian Archæological Mission.[1] Below are two pieces of this stone (C, D) discovered in the Minoan palaces; it is not found in Crete but has been brought over from Lipari.

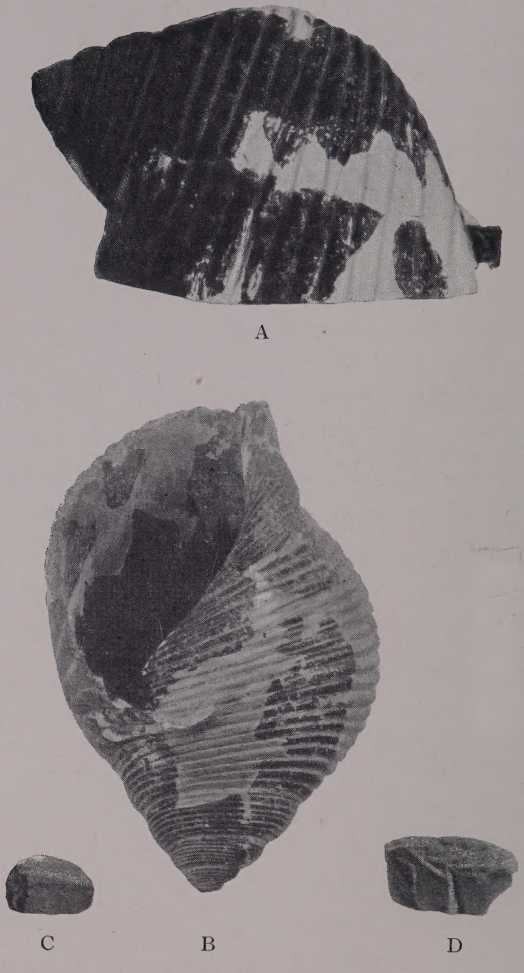


FIG. 199.—A, B, SHELL MADE OF LIPARITE, DISCOVERED AT HAGHIA TRIADA.

We know that the Minoan religion had a connection with the sea,[2] and that shells of various species coloured with lines of red, yellow, green, and black, following the natural furrows of the shell, were placed before the altars. In the excavations of Cannatello, near Girgenti, I also found pieces of the triton. The triton

[1] Paribène, *Rendiconti Lincei*, xii. 1903, p. 334.

[2] "Knossos Excavations," Evans, 1903, p. 43, *A. B. S. A.*, ix.

is still sounded in church in Piedmont, and I have myself sounded it as a child. During the services in Holy Week at Chieri, when the choir was singing the psalms, and a table was struck with sticks during the so-called tenebræ of the sepulchre, the sacristan gave us a triton shell to sound. Dr. Issel relates that during the services of Holy Week in the Cathedral of Genoa the *Triton nodiferum* used to be sounded, the same shell which I have found in caves among axes and knives of stone.[1]

4. OBSIDIAN

In Chapter IV. I spoke of the obsidian which I discovered at Phæstos, and gave illustrations of the knives and scrapers from the Island of Melos. I now return to this subject, as it is one of the most useful in the study of the commerce of the ancients, and, we may perhaps say, one of the earliest objects of exchange of which we can follow the track on the Aegean Sea.[2]

I illustrate a nucleus of obsidian found in the neolithic soil of Crete. By striking the lower and broader part long flakes as sharp as a knife-blade are detached. Some good nuclei give blades of obsidian more than 10 centimetres in length.[3]

Obsidian is very abundant in Melos,[4] and here the knives were made, which from the neolithic period were sent all over the Aegean. Enormous heaps of flakes were found there, attesting to the great extent of the trade in very ancient times. Besides the knives, saws and arrow-points were also made of obsidian, and this mineral long held the place now occupied by metal. The obsidian of Troy probably came from Melos, like

[1] A. Issel, *Rivista Ligure di Scienze, Lettere ed Arti*, Genova, 1908, p. 19.

[2] Obsidian is a vitreous volcanic stone produced by rapid cooling of the lava, forming a vitreous mass with bright fracture, splitting into sharp flakes ; colour brown-black, sometimes greenish. Pumice stone is of the same composition, and may be considered a spongy obsidian ; its filamentous structure is caused by the gases which have passed through it.

[3] Tsountas, Ἐφ. ἀρχ., 1898, Plate VIII.

[4] Bosanquet, "The Obsidian Trade," p. 216, *Excavations at Phylakopi in Milos*.

that found by Professor Tsountas in the neolithic settlement of Dimini and Sesklos. The use of obsidian marks an advance in the arts, because it cuts better than flint. The beautiful inlaid work discovered at Phæstos, the furniture inlaid with porcelain, was probably worked with obsidian knives. All the carved wood from the palaces of Phæstos and Knossos has disappeared, but we are certain when we see the pottery, the painting, and the metal-work, that in wood-carving, too, a high standard of excellence had been reached; the splendid work in ivory proves it. The fact that obsidian has been found in Egypt, where the best quality of flint is abundant, confirms the opinion that obsidian was sought for special work, for there were no deposits of this mineral[1] in Egypt. At Troy[2] the knives of obsidian are less plentiful than those of flint, but were found in all the four lower cities. The knives of obsidian served as razors, and were at that time the best for cutting the beard. Dr. Pernier recently published a Minoan vase showing a beard, which had quite a modern appearance. The Cretans wore long hair, but shaved the face. Even in the bronze age obsidian was used for razors, so that, when found in excavations, it is not a sign of the neolithic period.

FIG. 200.—NUCLEUS OF OBSIDIAN DISCOVERED IN NEOLITHIC SOIL AT PHÆSTOS.

5. TRADE IN OBSIDIAN KNIVES IN THE NEOLITHIC AGE

The currents of exchange were marked by obsidian. If obsidian is found, for example, among the pottery of the Cave of Zinzulusa, or in the Cave of Capo di Leuca in Terra d'Otranto,

[1] Petrie, *Diospolis Parva*, p. 27.

[2] Schliemann, *Troje*, p. 309.

we are certain that it was brought from a distance, because it is not naturally found in that neighbourhood or within a considerable distance. In the paleolithic age men had not yet learnt to chip obsidian, and the period at which the trade began can be fixed. Geological conditions exercised an influence upon the weapons and tools of various countries in the prehistoric age. In Egypt, where neuclei of flint are plentiful, great perfection in the technique may be observed, and here the finest weapons were found. In Crete arms of flint are rare and less fine, because the prime material adapted to the purpose was wanting. On the Pulo I saw that weapons and tools of calcareous stone were in use together with those of flint and jade, which were imported. Some large flakes had been made into spades for digging in the earth, and had been made triangular in shape and rather sharp at the edge, so as to cut the sods and move the earth.

The specialisation of industry is lost in the darkness of prehistory. The facility given by practice in doing a special work, and the skill acquired by the workers, are an incentive to the localisation of a manufacture in certain places. Professor Orsi has described the flint quarries of Monte Tabuto and Monte Racello, which are one of the memorable discoveries of the great palæethnologist.[1] For knives, arrows, axes, maces, rings, and ornaments, we know not only the place of manufacture, but also the place in which the trade was carried on. A similar workshop was discovered at Alba in Piedmont, and has been described with care by Signor Traverso. In the prehistoric Museum of Rome, where his collection was brought, we see the half-chipped flints, the broken axes brought to be repaired, others waiting to be sharpened. In the workshops of Alba there was no obsidian, but it is found in the neolithic caves of Liguria,[2] which is sufficient to prove the trade which was carried on in the neolithic age between the Ligurians and the southern islands of the Mediterranean.

[1] *Bullett. paletn. ital.*, xxiv. 1898, p. 165.

[2] Ibid., xii. 1886, p. 127.

6. MINOAN AMBER

The Ephor Xanthoudides, in the excavations made in 1906 at Kumasa, near Gortyna, discovered two pieces of amber in the tombs belonging to the close of the early Minoan period, or to the beginning of the Middle Minoan period. He gave them to me to analyse, and, unfortunately, I had partly to destroy them. They had probably been mounted within a small circle of wood or bone, for there was no hole for suspension. Both are of an orange-yellow colour, slightly granulated on the surface. I put the smaller piece upon a spatula of platinum and heated it over a gas-burner ; it fused into a drop which resembled oil, and began to boil ; it exhaled a pleasant perfume, and disappeared without leaving a trace of ash. Amber melts at 287°, and being composed of oxygen, hydrogen, and carbon burns away completely without leaving any residuum. This was certainly amber.[1] It was easy to know that amber is the juice of a fossilised plant, for there are pieces with insects in it which have been caught and enclosed in the viscous mass before it became solid. Pliny speaks in his " Natural History " of the ants and other insects seen in it.[2] Naturalists have described nearly three thousand species of insects found enclosed in amber. On the shores of the Baltic every storm which moves the sand uncovers fresh pieces of amber ; it is the beating of the waves on the shore which disinters the remains of the ancient forests buried there, and casts up on the beach the fragments of this fossilised resin. The Baltic is ever advancing on the land ; it was so in past ages, and it is easy to understand how, without digging for it, amber has been picked up on the seashore from time immemorial. At the mouth of the Simoneto, near Catania, pieces of yellow, red, and black amber are found. Dr. Silvestri made a fine collection of it, which has been described by Dr. Stoppani.[3]

[1] The Latin name of amber is *succinum*, from *succus;* this proves that amber was known to be a resin—that is, the juice of a plant. The Germans call it " Bernstern," or stone that burns.

[2] *Nat. Hist.*, xxxii. 11.

[3] *Bibliot. scientifica internazionale*, Milano, Dumolard, 1886, p. 208. L'Ambra.

Sicilian amber is a rarity for museums, and is not found in commerce ; the ancients were not acquainted with it, for no writer mentions it. I think, therefore, that the two pieces from Kumasa came from the Baltic.

7. THE TRADE IN AMBER IN PREHISTORIC TIMES

Though Pliny states as a certainty that amber came from the isles of the North, it may not be unprofitable to point out the confusion existing between the most reliable of Greek writers, which will show the difficulties met with by students of archæology, who rely too much on the help of literature, and will point out how archæology can throw light upon the interpretation of certain legends. The myth of Phaeton is anterior to Hesiod. Without his father's leave, Phaeton mounted on the chariot of the sun with the help of his sister, but rose too high in the heavens, and was precipitated into the Eridanus. Jupiter struck him with a thunderbolt. His sisters, who wept over his death, were transformed into poplar-trees, and their tears produce the amber as they fall year by year into the River Po. This is the legend whence Aristotle wrote that amber came from the Adriatic. But in this legend there was also a king of the Ligures named Cignus, and he, too, was punished and transformed into a real swan for having wept for the death of Phaeton ; this proves that before Homeric times relations existed between Greece and Liguria, which is a useful piece of information in connection with the study of pre-Homeric navigation. Now Theophrastus wrote that amber came from Liguria,[1] and Pythias, to whom we owe the description of the earliest voyages made by him in Northern Europe, asserts that amber came across Gaul and arrived at the mouth of the Rhone. The conclusion we may draw from this is that Marseilles, Liguria, and the head of the Adriatic were then, as they are now, the southern ports of discharge of the prehistoric trading routes from the North of Europe. Dr. Welcher believes that the legend of the Hyper-

[1] Theophrastus, *Fragmentum de Lapidibus*, ii.

boreans relates to the trade in amber.[1] According to mythology, Apollo had made a journey to the country of the Hyperboreans, and the Celts, writes Apollonius, believed that the tears of Apollo had been transformed into amber, and it seems reasonable to find in this myth an allusion to the earliest voyages made into Northern Europe in connection with the trade in amber.[2]

In Homer there is a confused allusion to amber, but it was not rare in the excavations of Corinth and Mycenæ. It is in the form of large beads for necklaces, like those which came to light in the terremare, and this may help us to a chronological date. I recollect seeing in the Museum of Parma a round piece of amber 8 centimetres in diameter, which had been found in the terramara of Castione. These objects are usually called spindle whorls, because they are of the same shape as the little knob with a hole in it which is put on the spindle to make it spin round, but they are really beads from necklaces. Many like these were found at Mycenæ, and Dr. Schliemann illustrated several in his book.[3] No amber was found at Butmir, or in other settlements of the neolithic age in Bosnia, and this proves that they had no relations with the Baltic; on the other hand, amber is plentiful in France of the reindeer period. It is found in the neolithic settlements in Scandinavia, but not earlier. I conclude that the amber found at Kumasa, in Crete, was brought at the beginning of the age of copper by the first explorers who went to fetch tin from the Cassiterides Islands. For this reason the discovery of

[1] Roscher, *Lexicon der Mythologie*, i. p. 2830.

[2] Another confused reminiscence of the caravans, which in prehistoric times carried amber from the Baltic for exchange with copper in the Mediterranean, is found in other legends which arose about the temple of Delos. Herodotus wrote of the inhabitants of Delos (iv. 33), "Who relate that from time to time sacred offerings from the country of the Hyperboreans arrive in Scythia wrapped in straw, and that from Scythia they are passed on from people to people towards the West, till they reach the Adriatic Sea, and then passing southward they are received first by the Hellenes of Dodona, and then are carried down to the Gulf of Aliaco, and then to Eubea, &c."

[3] *Mycenæ*, Fig. 355.

Dr. Xanthoudides is very valuable. The tombs of Kumasa have preserved the amber, as a seal which testifies to the fact that when bronze appeared in the Isle of Crete the Minoan navigators brought home with the tin the amber of the Baltic.

8. SILVER

Two silver daggers [1] were discovered at Kumasa, near Gortyna, in one of the most ancient tombs now known in Crete, by Dr. Xanthoudides. Silver appears with copper in Egypt also at the close of the neolithic period, and has been found by Dr. Flinders

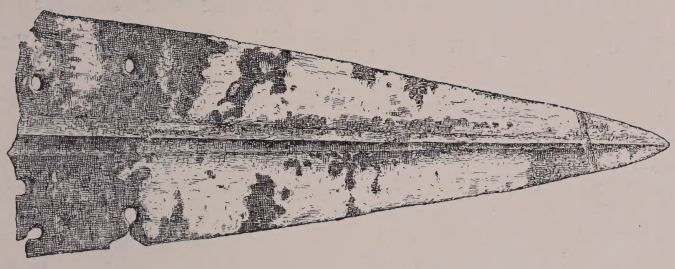


FIG. 201.—SILVER DAGGER DISCOVERED AT KUMASA. HALF SIZE.

Petrie in the tombs [2] in the form of a spoon, a ring, or beads for necklaces.

The question of the origin of this metal, bound up as it is with the history of Mediterranean civilisation and metallurgy, is worthy of a careful examination. I illustrate one of these silver daggers (Fig. 201, half the actual size). It will be seen that a well-made rib passes down the length of the blade to the point to strengthen the dagger, which would otherwise be liable to bend. Another silver dagger of the same shape, but rather smaller, found in the tombs of Kumasa, is illustrated in the "Palaces of

[1] I illustrated them in my book on the excavations in Crete, together with the contents of the tomb (*Palaces of Crete*, p. 271, Fig. 132).

[2] Flinders Petrie, *Diospolis parva*, p. 25.

Crete."[1] According to the researches of the brothers Siret[2] prehistoric silver can only have come from the mines of Spain, where this metal is found in a pure state. It is certainly probable that the first knowledge of silver should have been acquired from native silver, which, rare though it may be, is found pure in Spain and Sardinia. Pliny, however, said that it was found by the Athenians. The silver mines at Laurion, in Attica, are still worked. The process is rather complicated, and, as the brothers Siret observe, it is difficult to suppose that it was used before the native silver of Spain was known. Pliny describes the extraction of silver from galena.[3]

The silver mines of Attica were celebrated in the time of Pericles, and the accumulation of ancient scoriæ has been lately resmelted by a better method, and millions of francs have been gained by a French company.

Besides galena another ore, argirosi, much richer in silver, is found. It is a sulphuret of this metal which is malleable like silver, and it is not improbable that it was used before galena.

However this may be, if we admit that the predynastic Egyptians and the Cretans of Dr. Evans's Early Minoan III. period made use of a chemical process for the extraction of silver from galena or from argirosi, we have a proved fact not less important for the history of Mediterranean civilisation, that is, that at the close of the neolithic age a degree of culture had

[1] I illustrated them in my book on the excavations in Crete, together with the contents of the tomb (*Palaces of Crete*, p. 271, Fig. 132).

[2] H. and L. Siret, *Les premiers âges du métal*, 1887, p. 227.

[3] *Nat. History*, xxxiii. 31. Galena is a sulphuret of lead. When this mineral is argentiferous it is lighter in colour than galena which contains only lead. The first operation consists in melting the galena and concentrating successively this blend of lead and silver, separating the lead. When the fused mass cools, the lead solidifies and crystallises before the silver, and is deposited at the bottom of the crucible. Several repeated fusions are necessary to bring constantly to the surface a richer blend of silver. The cupellation is then made, that is, the lead is oxydised by a strong current of air, and pure silver is obtained. This is the ancient method known to Pliny, which is still, with some slight modification, used at the present day.

been reached which enabled a complex chemical process to be carried out.

The opinion, however, of the brothers Siret seems most probable, *i.e.*, that the argentiferous veins of Spain must have made this metal known before the process of extracting silver from the ores was learnt. The Cretans who sailed along the coasts of Spain on their way to fetch tin from the Cassiterides Islands must have carried home silver. This explanation agrees with the fact that lead is rare in prehistoric deposits, and that with the silver daggers amber was found in the same tombs.

9. HOW THE CENTRE OF GRAVITY OF MEDITERRANEAN HISTORY WAS MOVED TO THE WEST

With the latest progress of archæology the importance of the East with regard to the origin of Mediterranean civilisation is somewhat diminished and Western influence is more clearly defined. We will now examine the question as to how the centre of gravity of primitive history was moved towards the West. This idea, on which I have touched now and then in the course of this book, has already been unfolded by Dr. Salomon Reinach,[1] Dr. Much and others, especially in Germany, but the arguments which I shall adduce to prove the existence of a great prehistoric Mediterranean civilisation differ from those of the aforesaid writers, and I have, if I am not mistaken, collected positive archæological facts in favour of this thesis.

The brothers Siret, in the course of their excavations in Spain,[2] discovered certain earthenware cups identical with the vases of Knossos, published by Dr. Evans,[3] which came to light above the latest neolithic stratum. Similar vases were found by Dr. Petrie in the tombs of Abydos in Egypt, and others were found in the excavations made by Professor Schiaparelli at Heliopolis (as

[1] S. Reinach, "Le mirage oriental," *L'Anthropologie*, 1893, p. 557.

[2] H. and L. Siret, *Les premiers âges du métal dans le Sud-est de l'Espagne*, Anvers, 1887.

[3] A. Evans, *A. B. S. A.*, x. 23–25, Fig. 8, p. 24.

I have already said in Chapter V.). As the date of these Egyptian vases and of the Cretan ones is known with sufficient approximation, we can say that from the time of the earliest dynasties to the close of the neolithic age commercial relations existed between the countries at the two extremities of the Mediterranean. This discovery is not an accidental thing, and the vases cannot be considered as an importation, as they abound in Spain and the brothers Siret found them in different places at a distance from each other in the interior of the country.

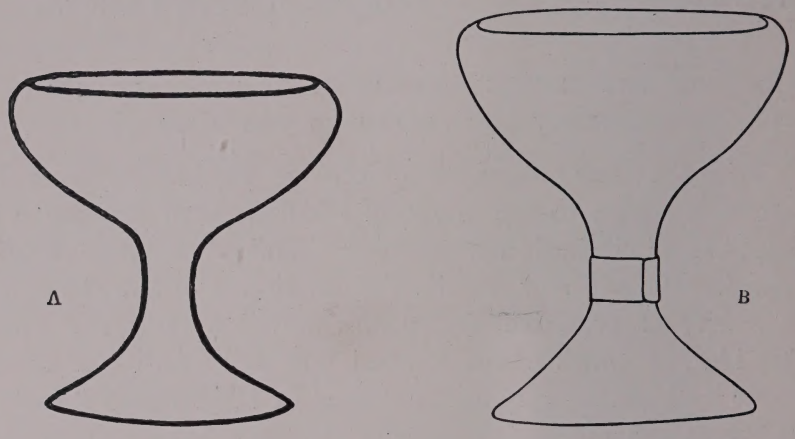


FIG. 202.—A, B, GOBLETS DISCOVERED IN SPAIN, IDENTICAL IN SHAPE WITH THOSE OF THE IST DYNASTY DISCOVERED IN NEOLITHIC SOIL IN EGYPT AND AT KNOSSOS.

The illustration, Fig. 202, A, B, one-fourth of the actual size, is taken from the work of the brothers Siret, and shows the outline of these vases. They were found in the tombs, together with flat copper axes, with weapons of stone and bone. Some copper knives had silver rivets to fix the blade into the handle. The vases were of neolithic form, polished, without decoration, and of dark blackish colour or slightly red. The earthenware, all made without the potter's wheel, is black or red, and often has a polished surface. When there is any decoration, the designs are very simple and neolithic in character, with broken lines and dots, and rarely with curvilinear incisions. One of these goblets (Fig. 202, B) has a

copper ring round the foot. These goblets were discovered near skeletons which were enclosed in urns of similar shape to the great amphoræ which Don Morelli found at Pietra Ligure, in the district of Genoa. Objects of silver were abundant, especially rings made of wire twisted in a spiral. When these vases were made in the province of Argar, silver was two and a half times as abundant as tin, judging from the rich store collected in hundreds of tombs by the brothers Siret. We may therefore admit, as regards metal, that this was a time differing little from that of the tombs at Kumasa, which belong to the second period of the primitive Minoan epoch in Crete. As tin does not exist in Spain, it was probably brought from England. In any case we are here at the beginning of the bronze age, in a phase of civilisation similar to that which I described in Italy corresponding to the age of copper, and the mineral wealth of the province of Argar both in copper and silver must have been the cause of the development of this civilisation. The brothers Siret are convinced that the population in this part of the Mediterranean has not been influenced by the East, but has rather given an impulse to progress in Eastern countries.

10. THE AUTONOMOUS CIVILISATION OF ITALY AND SPAIN

Neolithic civilisation had so great a development in Italy and Spain that it cannot be said to have been derived from the civilisation of the Aegean, local action appearing evident from very remote times. The pottery of Stentinello and Matrensa, discovered by Professor Orsi in Sicily, is sufficient to prove this. Nowhere up to the present time have such handsome vases come to light, both for their decoration of incised and stamped designs filled with white substance; for their artistic taste and the perfection of their execution we must hold that the Siculi of the neolithic age surpassed all contemporary nations in the art of pottery. The inventive genius of Italy has also distinguished itself in metal-work, and this has been shown in a paper of mine compar-

ing the original form of the Italian sickle with that of Eastern countries in the ages of copper and bronze.[1]

To return to what I said in Chapter XXI., for example, the Italian axe is of a very different type from the Cretan bipenna, and the absence of the axe with flanged edges in the Isle of Crete and the other countries of the East demonstrates the original development of metal-working in Italy from the age of copper to that of bronze and of iron ; for the evolution of the Italian type of axe till the wings were raised so as to obtain the maximum of solidity while using the least possible quantity of metal was, and should be considered as, the result of many years of experience, which were certainly needed before this form of axe could spread over the whole of Italy and beyond the Alps.

In Southern Spain, too, before the bronze age, there was already a developed civilisation. The people lived in huts which, to judge by the foundations, were similar to the huts of Italy. The terracotta votive figures and figures of animals[2] are similar to those which I have described in the preceding chapters, and we have seen that in their cult they too adored the sacral horns. In Crete, at Hissarlik, in Italy, as in Spain and in Egypt, appear the remains of the great neolithic culture, which during the lapse of centuries had extended over the whole basin of the Mediterranean and within the Continent of Europe, without there being now any possibility of distinguishing the part of this civilisation which comes from the East, from that which developed in the West.

We cannot now find out all the particulars of the movements of prehistoric times. The absence of dolmens in the Island of Crete proves that there was an interruption in the current from Eastern lands, and we may possibly have in Libya the centre of irradiation of the civilisation represented by the dolmen tombs, which, through Sicily and Italy, through Sardinia

[1] A. Mosso, *Memorie R. Accad. dei Lincei*, 1908, xii. p. 82.

[2] Siret, *op. cit.*, Plate XVII. p. 123.

and Corsica, or along the coasts of Spain, spread onward to the North of Europe.

The recent works on the dolmens of Great Britain[1] have brought to our knowledge a great number of these monuments in Cornwall and other parts of Great Britain, and we may consider the British Isles as the part of Europe where the construction of dolmens had the greatest development. This fact proves the closeness of the relations between Cornwall, with its tin mines, and the countries of Southern Europe during the early bronze age. The dolmens mark the prehistoric roads like rays pointing to the northern headquarters of the tin trade. In Spain and Portugal the dolmens bear witness that at the beginning of the bronze age the Iberian peninsula was passed through by caravans and the coasts of the Atlantic by ships making for the Islands of the Cassiterides in search of tin.[2] The fact that there are no dolmens in Greece or in the valley of the Danube[3] indicates that this road was little frequented in prehistoric times. This is easy to understand, not only on account of the greater difficulty of the land journey or the river ascent of the Danube in comparison with a sea voyage, but also because the warmer climate of the Mediterranean and of the coasts of the Atlantic would render a journey through the peninsula of Spain or Italy preferable to one through the Balkan peninsula. Archæological data agree with the inductions to be made from simple geographical facts. But the most evident proof of the maritime relations between Crete and the other countries of the Mediterranean in the Minoan age is in the fact that Minoan art was essentially the art of a seafaring people. The sea gods arose in Crete,[4] and designs of marine monsters are seen on the Mycenæan vases. That the Minoans were keen sailors may be recognised

[1] W. C. Borlase, *The Dolmens of Ireland.* W. Collings Lukis, *The Prehistoric Stone Monuments, Cornwall.*

[2] Cartailhac, *Les Ages préhistoriques de l'Espagne et du Portugal*, p. 161, Figs. 217, 218.

[3] Montelius, *Der Orient und Europa*, 1890, p. 15.

[4] H. R. Hall, *The Oldest Civilisation of Greece*, 1901, pp. 201, 296.

by the great number of seals found in Crete bearing the design of a boat. I gave several illustrations of these seals in Chapter XVII., Fig. 160; and other designs of island stones had already been published by Dr. Arthur Evans,[1] and his opinion is that these engraved stones are the seals of seamen.

[1] A. Evans, "Primitive Pictographs and a præ-Phœnician Script from Crete," *Journal of Hellenic Studies*, xiv. 1894, Figs. 28*a*, 34*a*. Ibid., "Further Discoveries of Cretan and Aegean Script," xvii. 1897, Figs. 2*a*, 3*a*, 75, *A. B. S. A.*, Fig. 7.

CHAPTER XXV

THE METALLIFEROUS CHAIN OF TUSCANY AND THE PREHISTORIC METALLURGICAL INDUSTRY IN ITALY

I. TEMESA

FEW lines have been more discussed than that which speaks of Temesa in the first canto of the Odyssey : "I avow me to be Mentes, son of wise Anchialus, and bear rule among the Taphians, lovers of the oar. And now am I come to shore, as thou seest, with ship and crew, sailing over the wine-dark sea, unto men of strange speech, even to Temesa in quest of copper, and my cargo is shining iron." [1]

Two cities were called by the name of Temesa, one in the Island of Cyprus and the other in South Italy. Temesa, in Cyprus, was in the interior of the island, among the forest-clad mountains, where the abundance of fuel made the smelting of copper easy ; the city of that name in Calabria was also celebrated from remote times. Its renown came from its geographical position, for the ancients greatly feared the passage between Scylla and Charybdis, not only on account of the whirlpools, the sirens and the storms, but especially on account of the

[1] "Μέντης Ἀγχιάλοιο δαΐφρονος εὔχομαι εἶναι
υἱός, ἀτὰρ Ταφίοισι φιληρέτμοισιν ἀνάσσω.
νῦν δ' ὧδε ξὺν νηὶ κατήλυθον ἠδ' ἑτάροισιν,
πλέων ἐπὶ οἴνοπα πόντον ἐπ' ἀλλοθρόους ἀνθρώπους,
ἐς Τεμέσην μετὰ χαλκὸν, ἄγω δ' αἴθωνα σίδηρον."
Od. i. 180–4.

pirates who permanently settled near the Straits of Messina, to profit, in the way of booty, by the difficulty of navigating the Straits.[1]

In what is now the Gulf of Sant' Euphemia, where the point of Italy narrows, goods were unloaded and carried by land to Temesa on the Tyrrhene Sea so as to avoid Scylla and Charybdis. The journey from the Ionian to the Tyrrhene Sea could be made in half a day, says Aristotle,[2] for at this point the mountains of the Sila are low. Pausanias relates that Odysseus in his wanderings touched on Temesa, where one of his companions who had insulted a maiden was stoned by the inhabitants.[3]

The reasons for locating the Temesa of Homer in Calabria are several and good. In the first place archæologists agree that the Taphii dwelt in Epirus. Mentes, King of the Taphii, carried on piracy and the slave trade like the Siculi.[4] From the heights of Cephalonia in the Ionian Sea the peaks of the Sila in Calabria can be seen on the horizon. More to the north the distance between Epirus and Italy is still less, and it can be understood that the Taphii were more likely to trade with Temesa in Calabria than with Temesa in Cyprus.

The critics have another reason in favour of this opinion. Homer used the word Τεμέσην, and the city in Cyprus was called Tamassos. Dr. Dörpfeld recalls the fact that iron was found in the Island of Taphos in Acarnania, near Ithaka, and this would explain why a cargo of iron should be taken to be exchanged for copper. Strabo, too, pronounces decisively in favour of the

[1] Strabo, xiv. 684, vi. 455.

[2] *Politica*, vii. 9, 2.

[3] Last year I had intended to make some excavations round Temesa, and had arranged with Professor Orsi to make excavations also in the neighbourhood of Locri, where archaic vases and metallic objects of the second and third Siculan periods had come to light, but as smallpox broke out in the district the project had to be given up. I allude to it to point out that evidence of a civilisation anterior to the Greek colonies exists near Temesa, on the side towards the Ionian Sea.

[4] Odyssey, i. 184. In the Eastern part of the Mediterranean they would be in competition with the Phœnicians, while in the Adriatic the Taphii would have a free hand.

Italian Temesa, and speaks of the mines which could be seen in his time, though they were no longer worked.[1] Temesa is now called Torre dei Lapi, and is really in a locality where mines may have existed, as may be understood from the information which Commendatore Baldacci, Director of the Geological Branch of the Royal Department of Mines, kindly sent me.[2]

2. THE COPPER OF PREHISTORIC WEAPONS

The term metalliferous chain was applied by Paolo Savi to the mountains which extend along the Tuscan shores from the Arno to the Ombrone. The mines of copper and tin which are found in this range have had decisive influence on Mediterranean civilisation. Even at the present day these metals are extracted from the mines of Tuscany in five different localities, in spite of the competition of America and the rich mines in various parts of the world which have put on the market extraordinary quantities of copper and tin. To give an idea of the potentialities of these deposits I record the fact that the mines of Montecatini produce about a hundred tons of metallic copper a year, and an English company extracted 55,000 tons of metallic copper at Campiglia Marittima in 1904. As the information we have as to the time at which bronze began to be used in Italy is both scanty and contradictory, I have sought to add the evidence of chemical analysis to the history of this period.

The copper of prehistoric weapons is not pure, but contains

[1] Strabo, *Geograph.*, vi.

[2] I give an extract from his letter: "The valley of the Savuto is, to a great extent, cut out of the formation of argillaceous and shining schists (phyllite). As regards the presence of useful minerals in this region there is one very important fact, and that is the existence of many threads and veins of quartz crossing in many localities the aforesaid phyllite. These veins often contain, though generally only in very small quantities, different metallic materials, *i.e.*, more or less argentiferous galena, chalcopyrites, raw copper. No metalliferous veins of industrial importance are now known in the valley of the Savuto or surrounding mountains, but it is quite possible that in ancient days some more or less rich cupriferous vein may have been known and worked, or possibly even some mass of native copper may have been found."

slight traces of other metals, such as lead, nickel, cobalt, iron, silver, antimony, zinc, tin, sulphur, manganese, bismuth, arsenic, &c. These extraneous substances serve as indications of the origin of this copper by comparing them with the impurities contained in the ramiferous minerals of various regions.

The study of these impurities which give a characteristic stamp to copper constitutes a field of research which is of great assistance to archæology. Dr. Fellenberg,[1] in Switzerland, was one of the first to analyse with exactness the chemical composition of many prehistoric weapons; and after him the brothers Siret[2] have compared the composition of the implements and arms of the earliest age of metal in Spain with the impurities of the copper from the mines in the neighbourhood.

During the last three years I have busied myself with similar researches and have published about a hundred analyses,[3] but the subject is so complicated that we are now only at the beginning, and I cannot advance as fast as I should like on account of the difficulty of obtaining material for analysis. Another cause of delay is the length of time required for each chemical analysis.

Not less important to the science of prehistoric metallurgy are the researches which I commenced with Professor Federico Giolitti on the micrographical examination of the most ancient implements of copper and bronze. By examining the polished surface of metals under the microscope we are able to distinguish the method of fusion, the mixture of the alloy, the temperature used in the process, and the action of the mechanical means used for hardening the metal.[4] As an example of the method in

[1] Fellenberg, *Mittheilungen der Naturforschenden Gesellschaft in Bern*, 1862, p. 1—1864, p. 122.

[2] H. and L. Siret, *premiers âges du métal dans le Sud-est de l'Espagne*, p. 213.

[3] Mosso, "Le armi più antiche di rame e di bronzo," *R. Accad. dei Lincei, Classe di Scienze morali*, xii. 1907.

[4] I cannot delay over these preliminary notes on the structure of metals, which form the subject of special papers, but I wish to express my deepest gratitude to the Minister of War, who has helped me in these researches with most praiseworthy liberality. I am also specially indebted to the Cav. D. G.

which some apparently insoluble problems in prehistory can be solved by means of chemical analysis, I will point out that the bronzes discovered at Troy [1] present impurities which differ from those of Tuscan copper, and that these differ from those of Germany. Now, in the neolithic period part of the weapons and metal implements were imported from Italy into Central Europe, and the less ancient ones have come from the mines of Germany and Austria. By chemical analysis we can distinguish the arms imported from Italy.

An important matter in the study of the impurities of copper is to distinguish the metal from Spain from that of the Italian mines, for one authoritative group of archæologists maintains that the neolithic race came into Italy by an emigration from the Iberian peninsula, and that after that relations were continued and the first copper weapons imported from Spain. To this school is opposed another which may be termed evolutionist, which believes that the neolithic race is descended from the most ancient or palæolithic race which dwelt in Italy.[2]

No less grave is the question which divides the palæethnologists as to the time and extension southwards of the civilisation which flourished in the valley of the Po during the terremare period; and if it was indeed the inhabitants of the terremare who introduced the use of bronze to the rest of Italy. To give another example of the value of these chemical researches to history, I will recall the many copper ingots of unknown origin found in Sicily.[3] If an analysis were to show that the copper used by the Siculan metal-workers is identical with that of Tuscany it would be a good step towards establishing the commercial currents which flowed through Italy from north to south.

Fiorina, Director of the Chemical Laboratory of the Royal Arsenal of Turin. It is only owing to these favourable conditions that I have been able to widen the field of research beyond what my predecessors have done.

[1] *Troja und Ilion*, i. p. 422.

[2] Issel, *Bullett. paletn. ital.*, xxviii. 1901, p. 248.

[3] P. Orsi, Ibid., xxvi. 1900, p. 281.

3. HOW THE IMPURITIES IN COPPER MAY ENABLE ITS ORIGIN TO BE RECOGNISED

I will give an example of how I made these comparisons in Tuscany. Two bronze axes from two Tuscan deposits at Campiglia d'Orcia were analysed. The first had been found by a peasant named Vincenzo Marri, the second not far off in the property of a certain Venturi.[1]

The axes from Marri's deposit are six in number, and above them lay six ingots of copper. They had been made by pouring melted copper into a round hole in the earth, by which means a disk of about 10 centimetres in diameter, convex and twisted on one side and smooth on the other, was produced. I was able to analyse a portion of these ingots also.

The Venturi deposit consisted of forty-two axes which were discovered at a depth of 40 centimetres in a hole dug out of the clayey ground, at the bottom of which was a large stone. The axes from this repository, though similar in type, differ from each other in size, weight, and in the notch for the heel, by the curve of the cutting part and the edges, so that not one can be said to have come from the same mould.[2] The weight of the axes varies from 386 to 170 grammes.

The axe from the Marri deposit weighs 250 grammes and that from the Venturi deposit weighs 325 grammes. The axes have the edges flanged to the whole length from the heel to the cutting edge, and this is a mark of remote antiquity, for in the terremare and in the least ancient Eastern palafitte axes with short wings are the commonest form. There were no other objects beside the forty-two axes, nor were there any human remains, and therefore the two deposits would seem from Professor Pigorini's description to have held votive offerings of the

[1] These axes, which were discovered in 1906, are in the Museum of Florence, and Professor Milani kindly allowed me to have 25 grammes of metal from each axe, which has been analysed by Cav. Fiorina, Director of the Chemical Laboratory of the Arsenal of Turin.

[2] Milani, "Notizie degli Scavi," *R. Accad. Lincei*, 1907, i.

early bronze age. I give the details of the analysis in the note.[1] The Marri axe is of a medium blend of bronze, while the other, with 6·954 per cent. of tin, is below the average. The Venturi axe had an admixture of lead in the proportion of 4·346 per cent. ; this metal is found at Monte Rombolo and in the Lanzi mine, not far from Campiglia. Bismuth, zinc, iron, arsenic, sulphur, and antimony are contained in slightly varying proportions in the three objects analysed. The negligible differences (which depend on the working of the metals and on the higher or lower degree of temperature of the fusion) allow of these objects being of metal from the same mine.

The analyses made in the "Fresenius" chemical laboratory at Wiesbaden show that the copper of the ingot of the Marri deposit and that which had been used to make the bronze of the axes probably came from the mine of Boccheggiano, near Campiglia, as the impurities of the metal are about equal (see table on next page).

The analyses of the pyrites and the copper ore from the mine of Boccheggiano were repeated at the arsenal of Turin and confirmed those of the laboratory of Fresenius, but to save time I omit them, as the small variations are negligible. The notable percentage of bismuth, manganese, and arsenic found in the axes and in the copper ingot give, with the other impurities of the metal, a special stamp, and indicate a connection between the

[1] The analysis gave the following results :—

	Axe from the Marri Deposit.	Axe from the Venturi Deposit.	Ingot of Copper, Marri Deposit.
	Per Cent.	Per Cent.	Per Cent.
Copper	Not determined	Not determined	Not determined
Tin	8·290	6·954	—
Lead	0·204	4·346	1·809
Bismuth	Traces	0·108	0·072
Zinc	1·600	2·080	1·905
Iron	0·140	0·490	0·350
Arsenic	0·009	0·004	0·012
Sulphur	0·068	0·123	0·110
Antimony	Not determined	Not determined	Traces

objects analysed and the copper of the mine of Boccheggiano, near Campiglia. I have examined some objects of copper and bronze discovered on the eastern slopes of the Apennines[1] and we had the same results. A small figure of copper from the

ANALYSIS OF THE CUPRIFEROUS PYRITES AND OF THE ORE FROM THE MINE OF BOCCHEGGIANO, CHEMICAL LABORATORY, FRESENIUS, WIESBADEN

	Cu. Pyrites.	Ore I.
	Per Cent.	Per Cent.
Iron	35·270	27·010
Copper	3·520	11·160
Silver	0·012	0·081
Lead	0·044	0·032
Bismuth	0·210	0·241
Tin	0·041	—
Zinc	0·366	0·327
Nickel and Cobalt	0·020	0·036
Manganese	0·060	0·059
Alumina	0·940	0·580
Lime	0·210	0·350
Magnesia	0·070	0·080
Sulphur	39·490	30·450
Arsenic	0·058	0·055
Antimony	0·021	Traces
Sulphuric acid	0·750	0·280
Carbonic acid	Traces	—
Residuum insoluble in acids (silex, &c.)	18·300	28·640
Oxygen combined with heavy metals, water in combination, and substances contained only in traces	0·618	0·675
	100·000	100·000

stratum which we consider to be of the Mycenæan period at the settlement of Coppa Nevigata[2] contains the same impurities

[1] Professor Pigorini having given me a piece of copper from the palafitte of Lake Garda, we analysed it also, with the following result: Copper, 97·605 per cent.; lead, 0·273 per cent.; bismuth, traces; iron, 1·430 per cent.; zinc, 0·440 per cent.; sulphur, 0·247 per cent.; arsenic, 0·005 per cent.; manganese, traces; tin, none. Judging by the impurities contained in this piece of copper, we might consider that it came from the mines of Tuscany.

[2] *Monumenti Antichi, Lincei*, vol. xix.

as the Tuscan copper.[1] That metal-working was well advanced at the period of the terremare is proved by the moulds of sandstone, of schist, of calcareous alabaster, and of pot-stone which were used for casting the objects of bronze which were found in abundance in the terremare and in the palafitte. Until the present time the bronzes of Central Italy have been little noticed, and for that reason I wished to analyse a bronze axe from a deposit at Alanno, in the Piceno, described by Professor Pelligrini.[2]

There are nine of these axes with the flanged edges, and therefore of great antiquity.[3] Two important facts result from this examination.[4] First, that metal-working had made such progress in those remote times that the best proportion of copper and tin to make the most resistant blend for bronze had already been fixed. The axe of Alanno contains, in fact, little more than 8 per cent. of tin, which is the formula now adopted for the bronze for cannon. Secondly, the copper of this axe contains the same impurities as Tuscan copper.

As for the chronology (not relative but absolute) of the axes, it is impossible to pronounce with certainty, and comparisons only can throw some light on the subject. The swords and knives found in the terremare have so much similarity with the arms of the Mycenæan period that we must suppose that the two civilisations were almost contemporaneous. The fibulæ in the form of a violin bow which are common in the Emilian terremare and numerous in the palafitte of Lake Garda are also parallel in

[1] Analysis made by the Royal Arsenal at Turin of copper mould which I found at Coppa Nevigata: Copper, 95·250 per cent.; lead, 0·096 per cent.; iron, 1·750 per cent.; zinc, traces; nickel, cobalt, 0·472 per cent.; bismuth, 0·043 per cent.; sulphur, 0·302 per cent.; arsenic, 0·011 per cent.; tin, traces; antimony, traces; losses, 0·076 per cent.

[2] *Notizie degli Scavi, Lincei*, v. 1908, p. 114.

[3] I have to thank Professor Dall' Osso, Director of the Museum of Ancona, for kindly allowing me to make this examination.

[4] Analysis of the axe from Alanno in the Piceno made by the Royal Arsenal of Turin: Copper, 91·300 per cent.; tin, 8·338 per cent.; lead, 0·282 per cent.; bismuth, none; iron, 0·028 per cent.; zinc and nickel, none; sulphur, 0·038 per cent.; arsenic, 0·014 per cent.; antimony, none.

date with the Mycenæan civilisation, marking an epoch before the Etruscans.

4. THE TIN OF TUSCANY

In the mines of Cento Camerelle, near Campiglia Marittima, in those of Temperino and of Monte Calvi, the chambers connected by little galleries by means of which the metal was extracted are still to be seen. A bronze pick and a few scarabs found at the bottom of a pit attest the remote antiquity of these mines. The stratum of carbonate of lime deposited by the infiltration of water in the walls is of considerable thickness, showing that these mines were abandoned a very long time ago. That the ancients extracted tin and not iron from the mines of Temperino is proved by the fact that the miners left intact too much good iron-stone which they would certainly have carried away if they had been mining for iron and not tin.

The engineer, Signor Cesare Martelli, found flint weapons in a mine near Massa Marittima. Cassiterite (oxide of tin) has lately been discovered at Cento Camerelle, near Campiglia Marittima, by Mr. Blanchard.[1] This mineral contains 72 per cent. of metallic tin. Scarcely was the discovery made than mining operations were begun, and in the first year (1877) 21 tons of cassiterite were brought up, and also 73 tons from a neighbouring mine, and now the tin is still being mined.

I applied for further information to the engineer Emilio Cortese, who is manager of the works, and he writes: "At Monte Rombolo I have been let down by ropes to a depth of 70 metres in order to inspect some large irregular empty spaces where an ore containing lead mixed with zinc seems to have been mined for. At Spinosa, too, I went down into similar places, resembling spiral galleries in vast empty spaces, but I could not make out what had been dug out there. At Monte Valerio all the tin ore to a depth of 35 metres had been worked out. The mines had been penetrated by degrees from the level, leaving only the narrow veins and the poor ore. Amongst the rubbish

[1] *Atti R. Accad. Lincei*, 1876, p. 93.

we found a rich ore containing about 40 per cent. of tin, more or less, which they possibly did not know how to treat, and also much stanniferous iron-stone, containing from 1 per cent. to 10 per cent. of tin."

Signor Capellini told me that copper is also worked at Montieri, not far from Campiglia: the name Montieri is derived from *Mons æris*, or mountain of bronze. Here we can see how the discovery of bronze was due to chance, for nature has placed together tin and copper in the bowels of the earth, and it must have been discovered by accident that by mixing the two minerals a firmer and more elastic metal of yellowish colour was obtained, better adapted for the manufacture of weapons and cutting instruments.

The more ancient weapons of copper and bronze discovered in Italy were either imported from the Aegean or made by Italian metal-workers. In a memorable work which forms the foundation of all later research on this subject,[1] Professor Colini says that daggers or knives of metal which reproduce the primitive form of the flint weapons are very rare in Italy.

"The enæolithic daggers of our country," continues Professor Colini, "if we take into account the variety of type, their perfection, the presence of a strengthening rib and the well-carried out process of fusion, do not for the most part represent the work of men who are scarcely initiated in the art of metallurgy, but are the products of an industry which has already made considerable progress."

The copper weapons similar to those of Crete, which were numerous all over Italy at the close of the neolithic age, mark a fixed point in the chronology of Mediterranean civilisation which is of great importance in the history of our country. It happened at that time, as we see it happen now, that objects of metal were everywhere imported from abroad in spite of the native metal industry. In the first period of the middle epoch (Middle Minoan I., according to Dr. Evans's classification) we find in Crete the same form of knife which was common in Italy

[1] *Bullett. paletn. ital.*, xxvii. 1901, pp. 95, 99.

at the end of the neolithic age. We may suppose that some of these arms were imported and have served as models; the Italian ones are certainly contemporary with those of Crete, for these types of dagger and knife fell out of use later, and the Minoans were using better knives of different shape a few centuries afterwards.

In Chapter XXI. I pointed out how abundant copper was in Etruria in the enæolithic age. This abundance of this metal can only be explained by the fact that the Tuscan mines were already well exploited. In a tomb at Battifolle, near Cortona,[1] a copper axe 19 centimetres in length was discovered. It is flat in shape and therefore of the most archaic type, but its unusual size supports the fact that at the end of the neolithic period copper was no longer a rare and precious metal in Etruria. Unfortunately I have not yet been able to analyse this weapon of the enæolithic age, but hope that it will prove to be cast of Tuscan copper.

Scarcely did the first samples of daggers and knives imported by the navigators of the Aegean become known than they were at once copied by the Italians, as to which Professor Colini writes:[2] "The existence in Italian daggers of special points in which they differed from their prototypes is a sure proof of local fabrication."

My researches confirm what Professor Colini had already said:[3] "I think it probable that the mineral from which the metal weapons and tools of the enæolithic period were made was obtained locally."

The neolithic age both in Italy and Crete should probably be reckoned as contemporaneous with the earliest Egyptian dynasties, and I think that the extraction of copper was started a few centuries later in the metalliferous chain of Tuscany.

The question of the origin of the Etruscans naturally presents itself, and much study of the civilisation of this people is not needed for the application of the preceding data to their

[1] *Bullett. paletn. ital.*, xxvi. 1900, p. 141, Plate VIII. Fig. 6.
[2] Ibid., 1901, xxvii. p. 99. [3] *Loc. cit.*, p. 118.

history. In company with Signor Fioroni[1] I had made a series of excavations in the most ancient Etruscan tombs round Corneto Tarquinia, and am now persuaded that these chemical researches will reflect a vivid light upon the history of Etruscan metal-work. It is only by placing the copper and tin industries at a much earlier date than we now attribute to them that we shall be able to comprehend the historical evolution of the Italian nation.

5. THE ETRUSCANS

The historian Niebuhr was one of the most authoritative supporters of the theory that the Etruscans came down from the Rhetian Alps into Italy. Opposed by many, this idea has recently been assailed by Professor Modestow[2] with arguments that seem to me conclusive, but Professor De Sanctis, in his "Storia dei Romani," returns to the old theory, saying that "the Etruscans came into Italy from Rhaetium," and that "the terre-mare are the work of a people who arrived in Italy without the knowledge of bronze."[3] Now we are certain that the copper and tin mines of Tuscany were worked before the Etruscans arrived. According to the calculation of Dr. Sophus Müller the age of bronze in Northern Europe begins about the eleventh century B.C.[4] An Italian vase of bronze discovered in a Swedish bog belongs to the eleventh century, writes Dr. Montelius;[5] the ornamentation in embossed work represents a wheel and two serpents. Other vases of the same form and decoration have been found in Denmark, Germany, and Austria.

The country of origin of all these vases is Italy, where we find the same form, the same technique, and the same decoration. Other similar vases from Northern Italy have come to light in Mecklenburg, Bavaria, and Hungary. I mentioned in Chapter

[1] "I Crani Etruschi," *Memorie, R. Accad. di Scienze*, 1906, lvi. p. 263.
[2] Modestow, *Introduction à l'Histoire Romaine*, 1907.
[3] G. De Sanctis, *Storia dei Romani*, vol. i. p. 123.
[4] Sophus Müller, *L'Europe préhistorique*, p. 60.
[5] O. Montelius, *Le relazioni fra l'Italia et la Scandinavia*, p. 233.

XV. the Italian daggers which came from the excavations of Northern Europe.

Our present knowledge of the origin of the Etruscans is so incomplete that we cannot say when they reached Italy. According to the tradition of their priests they arrived about 1050 B.C. Archæologists are divided into two groups, the one group tends to bring this date forward,[1] while the other seeks to put it further back. The most recent discoveries seem to support the view of those who would put the date as far back as possible; however this may be, we have in Tuscany and in Latium monuments of a civilisation earlier than the Etruscans, and which give testimony of Mycenæan influence. Cupola tombs like the Minoan tombs are found not only at Cuma, but also in Etruria; that, for instance, at Casal Marittimo, which is identical with the tombs of Præsos and of Panaghia in Crete.[2] The stones which form the cupola project one beyond another towards the inside, and, either by reason of the counter-weight or because of the surrounding earth, they remain firm. It is a different form of vault from our present one, in which the stones or bricks form an arched wall which is sustained by the opposite portion. Similar tombs with a cupola of projecting stones, and with an entrance corridor, are common in Etruria. Besides these small vaults, very high ones were constructed in Crete, as may be seen in the tomb of Isopata, discovered by Dr. Evans near Knossos, which is 8 metres in height. The outline is identical with that of the famous tomb, the so-called "Treasury of Atreus," at Mycenæ. By the magnificence of the vases and the grandeur of the edifice, Dr. Evans considers that it must be the tomb of a prince, and believes it to be earlier than the Treasury of Atreus, which is of a more developed style of architecture. It is probably contemporary with the XIth Dynasty in Egypt.

The tombs of Vejo and of Regulini Galassi are of the same type of architecture. Professor Pinza, after studying the origin

[1] Karo, "Cenni sulla cronologia preclassica nell' Italia centrale," *Bullett. paletn. ital.*, xxiv. 1898, p. 144; xxx. 1904, p. 28.

[2] Panaghia, *American Journal of Archæology*, 1901, p. 283.

of some types of Tyrrhene architecture,[1] concluded that "generally speaking with regard to the whole basin of the Mediterranean, and also to those of the northern seas, the types introduced there having evidently been brought in through relations with our basin, the common types are evidently derived from pre-Mycenæan and proto-Mycenæan prototypes."

In the present state of archæology we are unable to explain the resemblance of these tombs with the Minoan tombs of Crete, because their contents, *i.e.*, the utensils, are less ancient than the tombs.

The most serious lacuna of modern archæology is in connection with the origin of the Etruscans and the time preceding the foundation of Rome, and these are just the most vital points in our history. Professor Boni discovered upon the virgin soil in the Roman Forum the tomb of a child, prepared by the parents with an affectionate care that fills us with admiration. The body was enclosed in the hollowed-out trunk of an oak-tree, which was placed in a small chapel built of pieces of tufa. Upon the child's body was a copper belt with clasp and pendant. On the right arm was an ivory bracelet ; there were spiral rings, too, made of copper wire, and a large number of glass and enamel beads were attached to the tunic ; but most interesting of all are several fibulæ of bronze with disks of amber.

This interment is little earlier than the eighth century. During the iron age, upon the hills round the Forum, lived a rich and highly civilised people, but we know little or nothing of the primitive Romans, and the case is the same with regard to the Etruscans. Some archæologists like Professor Pigorini suppose that the band of Etruscans who came into Italy consisted of only a few people, who, having fallen into the midst of an intelligent population, and in suitable country, were able to give a new impulse to industry. The population, as we have seen in the chapter upon the age of copper, was dense, rich, and hard working. The Etruscans arrived, bringing with them a superior

[1] Pinza, "Monumenti primitivi della Sardegna," *Monumenti Antichi, Lincei*, xi. 277 ; Idem, *Congresso Storico internazionale di Roma*, p. 469.

culture, and at once began to work the iron mines of the Island of Elba, and those of tin and copper.

We have no information as to what happened in the middle period in the Aegean after the fall of Minoan and Mycenæan power. By some this decadence is attributed to the invasion of the Dorians from the north. Let the historians decide. It would however seem from the account of Cretan art given in the former volume, that Minoan civilisation set after a glorious course in a great parabola, and coming as it does after a dominion of about three thousand years, this dissolution may be regarded as the biological effect which even in states brings about senile decay. Granted a retrocession of civilisation, we can reconstitute the surroundings and economical conditions of the middle ages which preceded the poems of the Odyssey and the Iliad. Commerce being interrupted, there was a great and general crisis. Wealth was so much diminished, that in the so-called Dipylon period, silver and gold become much rarer in the excavations, and when found are only in thin plates.[1] I excavated with Professor Quagliati two tombs of this period, both intact, one at S. Angelo di Muxara, and the other at Crispiano, near Taranto, and though many fine vases were found in them, neither contained any metal. This absence of bronze (though the pottery was rich and abundant) makes one think that before 1000 B.C. there had been a crisis in metals which had greatly raised the value of bronze. The introduction of iron may have contributed to render other metals more scarce, and here I come upon the problem of these crises, but have no evidence to go into the question with. It is certain that the Aegean, having been eclipsed by the commercial power of Crete, offered a less quantity of copper in the Mediterranean markets, and the rapid development of civilisation in Central and Northern Europe absorbed a larger quantity. It was at this period before the Etruscans that the industry of Tuscan bronze was launched.

And Italy, which was at first the most important landing-place of the Mediterranean, became by reason of this crisis the

[1] Sophus Müller, *L'Europe préhistorique*, p. 127.

most active metallurgical workshop of Europe. Unfortunately the material is wanting by which we might have reconstructed its political economy. Written history only begins with the age of iron, and as to the earlier period we are quite in the dark, for in a few centuries everything was forgotten.

We know not whence came the bronze of the Homeric period, and historians have overlooked the particulars of the mines whence copper and tin were obtained. In Greece, only the ports of transit where the trade was carried on are recorded. First Delos, then Aegina, next Corinth, and finally Syracuse. Pliny explains these changes,[1] saying that they depended on the improvements made in the smelting. When he speaks of copper in Italy, he says that at one time it came from Campania and in his own time from Bergamo, but no copper mines are in existence in either of these regions. The statement of Simonides of Chios,[2] that two islands at the head of the Adriatic yielded the best tin, may allude to the tin of Tuscany, which was brought to the Adriatic by the Etruscans.

One indication of the export of bronze from Tuscany is found in the enormous quantity of amber in the tombs. This must have been obtained by way of barter from the North of Europe. Four kilogrammes of amber were found in one single tomb at Vetulonia. The skill of the Etruscans in metal-work is known to all. They were unsurpassed in chiselling, and were very skilful in making thin plates of bronze for the manufacture of helmets, shields, beds, and seats; situlæ, pails and coffers in repoussé work, fibulæ of all shapes, statues, chains and implements for the toilet had become their monopoly, and they grew rich rapidly. The apogee of their wealth corresponds with the time of greatest expansion of bronze and the beginning of the trade in iron which the Etruscans diffused throughout Europe. The treaty of commerce between the Etruscans and Carthaginians, of which Aristotle speaks,[3] is an important document in the history of commerce.

[1] *Nat. Hist.*, xxxiv. [2] 391, 393.

[3] *Politica*, iii. 5.

Objects of metal must have been the basis of exchange of the Etruscans. We know that Etruscan bronzes were much esteemed at Athens in the fifth century, and as the vases of Attica came into fashion the Etruscan navigators went over to obtain them in exchange for Etruscan bronzes. We can only explain the history of the Etruscans by taking into account their financial schemes, and we find them making war on the Phocæans, who had founded a colony at Marseilles, in 562, and occupying Corsica. This was the route by which they could most easily carry on the trade from Italy by the Straits of Messina and along the coast of Sardinia.

Professor Chantre's study[1] of the bronze age shows by statistics that 30 per cent. of the prehistoric bronze objects now catalogued in France were found in the basin of the Rhone, thus proving that the bronze trade passed by the mouth of the Rhone, the route by which tin came from England.

The tin mines of Tuscany which are now worked were known to the Etruscans. Being in possession of the prime materials necessary to form the blend for bronze, they tried to conquer the whole of the market and to obtain the monopoly of the bronze trade in the Mediterranean; and for that purpose, besides the struggle with Marseilles, the port of arrival of the caravans which crossed France with the tin from England, the Etruscans had occupied the valley of the Po, so as to keep the passes of the Alps free for their trade, and also possessed some ports on the Adriatic.

Those authors may be right who say that wars are always made for selfish reasons, but this does not prevent an industrial nation, in spite of its selfishness, from being honourable and well deserving before the civilised world.[2]

We may therefore conclude that the mines of Tuscany were being worked long before the time of the Phœnicians. The

[1] E. Chantre, *Age du Bronze*, p. 308.

[2] Sophus Müller recognised this when he wrote, "Le mouvement de civilisation de l'Europe centrale a eu précisément son point de départ en Italie" (*L'Europe préhistorique*, p. 14).

Etruscans were, it is true, attracted thither by the metalliferous chain, but the bronze industry had already been carried on for centuries. If we follow the fortunes of the Etruscans beyond the mines of Tuscany we must seek them in the Isle of Elba, where they resorted in search of iron, and they were the ironworkers by whom this metal was diffused over Italy and Europe.

6. CUMÆ

Upon the hill of Cumæ, and beneath the ruins of the Acropolis, was a prehistoric village, and the excavations made there in 1897 brought to light some vases of the neolithic period. Some fragments of Mycenæan vases, now in the Naples Museum, were discovered near Santa Lucia, within the city of Naples. Mycenæan influence in the Gulf of Naples is shown by the pottery of the Sarno (Fig. 203). This is not simply a question of an Aegean vessel landing upon the shores of the Gulf and leaving there a vase or two ; but the people who lived here, having seen and admired this type of pottery, learned to make it with the same kind of fine yellowish clay, which they decorated with brown or dark red lines.

Dædalos, the celebrated architect and sculptor of Crete, built a temple at Cumæ,[1] and therefore we must allow that when the Hellenes came to found a colony there a thousand years before Christ, the Gulf of Naples was already an important commercial station.[2]

The fact that the Island of Ischia was called *Aenaria* shows that what is now the case was the case then. Campania, Cumæ, and the Island of Ischia are the centres of the trade in copper and bronze, though they are situated in a region devoid of copper mines. Iron-stone from Spain is smelted in tall furnaces in England, and from India and Peru rough ore is brought over

[1] Virgil, *Aeneid*, vi. 14.

[2] Patroni, "Nuovi monumenti di una Cuma italica anteriore alla fondazione della colonia greca" (*Bullett. paletn. ital.*, anno 25, vol. v. 1899, p. 183). There were no Hellenic vases, all are red and hand-made.

FIG. 203.—PREHISTORIC POTTERY OF MYCENÆAN TYPE MANUFACTURED IN THE VALLEY OF THE SARNO. HALF SIZE. MUSEUM OF NAPLES.

from which the tin is extracted in England. Cato[1] commends the vases of copper from Capua and Nola. The copper of Tuscany was possibly brought to Capua, where the Etruscans were established, as is proved by evidence which has come to light there.[2] The fact that Cumæ was a Greek colony before 1000 B.C., and the most ancient of all those founded by the Hellenes in Italy, makes us understand the great importance of Italy in the metal trade with regard to the Aegean. Only by taking this into account can we explain why the Chalcidians did not stop in Sicily, but passed by that most fertile island to settle in the Isle of Ischia, whence, as Livy says, they passed on to Cumæ.[3]

I do not think I am wrong in saying that the copper and tin trade is the mariner's compass of prehistory. The route by which Minoan navigators sailed the Mediterranean to obtain the supplies of tin necessary for their metal-working industry is still followed by traders of later days. We find traces of Mycenæan civilisation at Marseilles and Narbonne,[4] and this proves that long before the arrival of the Phœnicians relations existed between Southern France and the Aegean.

Commercial reasons are often the cause of historical events, and here we have an instance. The Chalcidians, when their own copper mines were nearly exhausted, came to Italy attracted by the metal industry of the country, and possibly also with the object of selling Greek vases there. The same reasons brought the Phocæans to Marseilles. The earlier colonies were simple landing-places, and for that reason were situated on islands or promontories which could be easily defended, while leaving the surrounding country in possession of the indigenes. Agricul-

[1] Cato, *De Agric.*, 135.

[2] Patroni, "Buccheri campani, contributo alla storia della ceramica italiana e delle relazioni fra l'Etruria e la Campania," *Studi e materiali di Archeologia*, del Prof. Milani, 1901.

[3] Livy, viii. 225.

[4] G. Vasseur, "Découverte de poteries à décoration mycénienne dans les environs de Marseille," *Comptes rendus Acad. des inscriptions*, Paris, 1905, p. 383.

tural colonies were only formed later, when small independent states, within their own territory, were formed at Sibari, Taranto, Syracuse, and elsewhere.

We will now study the strata of civilisation which preceded the foundation of Rome. In the year 524 B.C. the great expedition of the Etruscans against Cumæ took place. The Etruscans, as Polybius says, had twelve cities in Campania.[1] In the war waged for commercial reasons between the Greeks and the Etruscans, the Latins joined with the Greeks in order to shake off the yoke of the Etruscans, and this was the beginning of the dominion of Rome.[2] Fifty years later Cumæ applied to Hiero of Syracuse for help against the Etruscans. Even before the excavations at Olympia a helmet, now in the British Museum, was discovered in the bed of the Alpheus, upon which is inscribed in archaic characters the dedication of a trophy of arms to Jupiter by Hiero in memory of the defeat of the Etruscans in the battle of Cumæ.

[1] Polybius, ii. 17.

[2] Freeman, *History of Sicily*, vol. ii. p. 249.

CHAPTER XXVI

THE MEDITERRANEAN RACE

I. THE AGREEMENT OF ARCHÆOLOGY AND ANTHROPOLOGY

THE doctrine of evolution cannot be applied to man of the Mediterranean race, for the form of his brain and the size of his skull had already reached their complete development when he appeared on the threshold of modern civilisation (if it is allowable to say so, and to omit the whole of the palæolithic age and the origin of man, as to which science has not yet made a pronouncement). The crania which I found in the neolithic necropolis of the Pulo and in the dolmen of Bisceglie are identical with those of the people who now live in the same localities. We know not how much time has passed since that epoch without any modification of the brain having been effected by the constant increase of brain work, and as we have up to the present time no evidence to establish, even approximately, the absolute chronology of the neolithic age, this book opened with the studies made in Egypt and Crete, where recent excavations have given some indication of the date of the latest stone age and of the first appearance of copper and of bronze. In spite of the great superficial extent of the deposits, the human detritus of the neolithic age has not been exhaustively studied. If our knowledge of the life of the race is very incomplete, we have one excuse in the fact that the depths of the strata is insufficient for us to follow the development of their history. In few places do we find deposits like those of Crete, where they are above 6 metres in depth, and

where it is possible to study better than elsewhere the progress of neolithic civilisation.

The uniform mode of life and the mutual resemblance (not to say the identity) of the men of the neolithic civilisation in the Mediterranean basin finds an explanation through anthropological study. It is the same people ; they are men of the same blood who have co-operated in the grand work of setting the foundation of modern civilisation. It is the race with the oval or long heads and dark hair which have led forth the human race from barbarism. The minority, men with round heads from the East of Europe, have had no influence on neolithic civilisation. Anthropological study is fully in agreement with archæology, and here too Egypt and Crete serve as a guide, for in these countries not only do we know more nearly the chronology of the skeletons, but also that here the crania which have come to light are more numerous and more ancient than on the Continent.

The density of the neolithic population was greater than had been believed. In France, M. Déchelette made an inventory of the neolithic settlements (let us hope that some one will soon do this for Italy also). Traces of neolithic dwellings were found in sixty-seven departments ; and tombs with huts to correspond are very common in Spain also, and in other parts of Europe. This great extent of land occupied by neolithic races is enough to exclude the hypothesis that the smooth, polished flint weapons, the pottery and domestic animals had been brought in by the immigration of a people from the East.

In the basin of the Mediterranean (and in a great part of Europe) men passed into a state of civilisation while perfecting their industries by spontaneous development through the commercial relations of various countries, and specially by the social influence exercised by maritime communication.

Now that the doctrine of the Aryans and of the Indo-German people has fallen, we ought to recognise in the uniformity of the race a good explanation of the uniformity of Mediterranean culture. In the length of time which separates the palæolithic age from the bronze age we find no trace of an invading race

who could have exterminated the people whose home and country they had conquered. Nor was it the crossing of races which has effected a more rapid rise in civilisation, for the Mediterranean race had alone accomplished the greatest progress before history began. It is not the round-headed or brachycephalic men from the East to whom Europe is indebted for the origin of her civilisation, and we shall see this more clearly in the following paragraphs.

2. EGYPTIAN CRANIA OF THE EARLIEST DYNASTIES

While touching for a moment the subject of the origin of the European nations, I declare that I attribute little importance to to race; and though I admit some psychical predisposition, I believe that education and surroundings are the decisive cause of progress in individuals and nations. A mild climate, good and plentiful food gave impulse to civilisation in the countries of the South, and geographical conditions have also influenced their history, but when the seed of civilisation fell on less fertile ground it developed equally. The great diversity of European peoples and nationalities, as they now exist in Europe, had no relation to the form of the skull. Before the Asiatic race was crossed with the Mediterranean the skull of the Europeans had already attained its maximum development. No improvement in the physical constitution of man was brought about by invasions from the East, and it may be said that the evolution of our race was already arrested before the neolithic period. The most ancient skulls found at Cro Magnon, in France, are equal in capacity (and therefore in development of the brain) to the most perfect modern skulls.

In Africa, all have the long head; and it is in Asia that the opposite centre, that of the people with the round heads, exists; or, to use the technical expression, the centre of irradiation of the dolichocephalic[1] race is in Africa, and in Asia is that of the

[1] The cephalic index is the breadth of the skull above the ears expressed in a percentage of the length from the forehead to the occiput. A round head

brachycephals. Europe has a mixed population like that of Italy, where round heads are prominent in the North and long heads in the South.

I measured the Egyptian skulls, of which there are above two hundred of the IIIrd to the XIth Dynasty, brought by Professor Schiaparelli to the Museum of Turin. I intend later on to write more fully upon these skulls and their skeletons, but now give measurements of a score[1] from Assiout, of which, as will be seen, only three are brachycephalic. This people of primitive Egypt is

may have an index of 100 or more, while a longer skull will give a fraction of 100. Skulls with an index of 80 to 100 are termed brachycephalic ; those below 75 are dolichocephalic. Indices between 75 and 80 are termed mesaticephalic.

[1] EGYPTIAN CRANIA OF THE FIRST DYNASTIES

No.	Circumference.	Antero-posterior Diameter.	Transverse Diameter.	Cephalic Index.
1	54·0	17·9	14·5	81·0
2	51·0	17·6	14·0	79·5
3	51·0	17·9	13·7	76·5
4	53·0	18·5	13·7	74·1
5	52·0	18·6	13·6	73·1
6	48·0	17·2	12·7	73·8
7	51·5	18·0	13·7	76·1
8	51·0	18·0	14·0	77·8
9	51·5	18·2	13·7	75·3
10	49·5	17·2	13·5	78·5
11	46·0	16·1	12·6	72·3
12	49·0	17·6	13·6	77·3
13	51·0	18·0	13·2	73·3
14	50·0	17·4	14·1	81·0
15	49·5	17·4	13·4	77·0
16	50·0	17·4	13·4	77·0
17	51·0	18·2	13·6	74·7
18	49·0	17·2	14·0	81·4
19	50·5	17·7	13·0	73·4
20	47·0	17·0	12·3	72·4
21	54·5	18·4	14·4	78·3
22	49·5	17·5	12·7	72·6

therefore a purely dolichocephalic race.[1] Professor Sergi has shown that the ancient world has not felt the influence of the Asiatic race and that the whole history of our civilisation must be considered as the history of the Mediterranean race.[2]

North Africa had a decisive influence on the diffusion of neolithic civilisation, and upon the monuments of the first dynasties as well as on the vases of the neolithic age in Egypt we find the figures of the elephant, the ass, and the ostrich, which are the animals characteristic of Central Africa. The horse and the camel do not figure on the monuments of the most ancient dynasties.[3]

Two facts form the foundation of prehistory : the first is that the dolichocephalic race was spread over the whole surface of Europe from the neolithic age ; the second, that at the beginning of the age of copper and bronze the Asiatic race with round heads appeared and mixed with the primitive population of Europe. Many still believe that our culture comes from Asia, but anthropology has decided this controversy, and we know that the Asiatic race never penetrated into Egypt or into the Isles of the Aegean.

3. THE CROSSING OF RACES IN EUROPE

A line drawn from the Alps to the Himalaya would almost serve as an equator to divide the two most developed portions of the human race. The people with long head and oval face lie to

[1] Dr. Fouquet measured more than one hundred skulls of the neolithic age. The anthropological material was supplied to him by M. de Morgan from excavations made in five necropoles (Fouquet, *Recherches sur les crânes de l'époque de la piérre taillée en Égypte*). The measurements form, with the illustrations of the skulls, an appendix to M. de Morgan's second volume on Egypt, p. 268. The average cephalic index works out at 70·6. Thomson and Randall MacIver found, when measuring the predynastic skulls of Abydos, that out of 67 skulls, 3 only differed from the Mediterranean type (Thomson and Randall MacIver, *The Ancient Races of the Thebaid*, 1905).

[2] *Europa*, p. 424.

[3] Maspero, *Histoire ancienne des peuples de l'Orient*, p. 11.

the south of this line; those with the round head, square face, and prominent zygoma are above this line.[1]

During the neolithic age and at the beginning of the age of metals, the population was dolichocephalic; and the people of England, Sweden, and Norway and Southern France are still dolichocephalic. Belgium, Holland, the part of Germany near the Baltic, Spain, South Italy, Greece, the whole of Africa, Egypt, and Arabia are also inhabited by the Mediterranean race. It was only at the end of the neolithic period that the movement of the brachycephalic race towards Europe began.

The recent exploration of Turkestan by the Americans with the funds of the Carnegie Trust brought to our knowledge a very early civilisation between Lake Aral and the Caspian Sea to the north of Persia. In some of the cumuli the successive strata of habitation had raised the surface to the height of 20 metres, seven of which were below the actual level of the soil, and Dr. Pumpelly[2] calculated that they dated back to 8000 B.C. On the level of the virgin soil no trace of domestic animals was found. The first metal objects are of copper; the skeletons were in a contracted position, and the crania are dolichocephalic. The importance of these observations lies in the fact that these crania[3] were not far from the Pamirs, the centre whence the human current from the Far East was supposed to move. But we cannot turn to these people who were ignorant of the neolithic civilisation to find the progenitors of the neolithic race of Egypt and the Aegean. They knew no weapon of stone for offence or defence, no arrow-points, no axes, no lance-heads. It was a primitive race who passed to the knowledge

[1] Ripley, *Races of Europe*. Sergi, *L'Europa*, p. 400.

[2] Pumpelly, "Interdependent Evolution of Vases and Civilisation," *Bulletin of the Geological Society of America*, vol. xvii. p. 637, 1906.

[3] Professor Sergi, to whom the examination of this material was entrusted, declared that neither in the skull nor in the facial bones did they show any visible variation from the characters commonly found in skulls of the Mediterranean race ("Dalle esplorazioni del Turkestan," *Atti Società romana di Antropologia*, xiii. 1907).

of metals without having known the weapons of flint. This deficiency has been met with among other primitive races.[1]

Although the origin of man is wrapped in mystery, naturalists are agreed in admitting the preponderating influence of Africa upon the population of Europe. When the migrations began towards Spain, Italy, and Greece from the northern coasts of Africa we know not. The coasts of the Mediterranean were different from what they are now, and possibly there was terrestrial communication between Africa and Italy. If we look at a map where the depths of the sea are marked, we see that the water is deeper in the Ionian and Tyrrhene Seas than near Sicily on the side nearest Africa. Dr. Arthur Issel discovered at Malta the remains of a hearth with hippopotamus bones and a large fragment of a vase with vertical handles with an incised decoration of a frieze of neolithic character. This proves that the Island of Malta, now about 100 kilometres from Sicily, must have had great rivers, for otherwise the hippopotamus would not have lived there, and the great valleys formed by erosion, which are now seen in Malta,[2] attest that there really were great watercourses. The crust of the earth in South Italy seems so thin that possibly greater changes have been produced by seismic phenomena in the neolithic age than in historic times.

We do not know by what chance the first inhabitants who came from Africa became mixed with the last arrivals, but it is certain that Europe cannot have originally produced man, and our genealogical tree had its roots in Africa. As it was necessary to the monkeys, who have the greatest affinity to man, to have a warm climate and plentiful food in the midst of abundant vegetation, so also were suitable surroundings in a southern country

[1] The recent studies of the brothers Sarasin in Ceylon have shown us the Veddahs in the palæolithic state. They work in stone and bone to make knives, lancets, hammers, but are unacquainted with the axe, which is the commonest weapon of the stone age, nor have they pottery (Paul and Fritz Sarasin, *Ergebnisse naturwissenschaftlicher Forschungen auf Ceylan*, Wiesbaden, 1908, p. 44).

[2] A. Issel, "Malta, Residuo di una terra sommersa," *Rivista Marittima*, 1874, p. 116.

necessary for the development of man, and this explains why the first inhabitants of Europe came from Africa.

The researches of Calori and Nicolucci in the valley of the Po have shown that the most ancient skulls were dolichocephalic, and that above this primitive race another people with round skulls had been superposed, and this people lives there to this day.

At Worms on the Rhine,[1] where the present inhabitants are brachycephalic, dolichocephalic skulls only, like those of Liguria, are found in the neolithic tombs. The changes through which Europe has passed before history are romantic and full of a poetry as yet untouched by literature. It is grievous to observe the unhealthy tendency of modern writers, who weave romances with impossible inventions, and morbid ideas which are not far from madness, when they might find in these prehistoric ages a virgin field of youthful inspiration similar to that of the epics of primitive times.

Recent studies on the diffusion of copper weapons show this period in a less terrible light than when the idea hitherto upheld by archæologists held ground—namely, that the Aryan people had entered Europe from Asia, bringing with them weapons of bronze and challenging the inhabitants, who were only armed with stone axes and knives, in order to exterminate them.

We have seen how slowly first copper and then bronze penetrated into the Continent from the Aegean and from Crete ; but we find in recent works on the subject a serious degree of pessimism which, we hope, may be dissipated by later research. Professor De Sanctis, in his "History of the Romans," says : "Public and private hospitality, which tempered the barbarity of primitive customs among classic peoples, was unknown to the Indo-Europeans, as we may gather from the diversity of terms which designate this institution in different languages. In such a state of society war means the extermination of the conquered or their reduction to a state of slavery." Philologists have reached

[1] Mehlis, "Die Ligurerfrage," *Archiv. f. Anthrop.*, xxvi. 1899. Mehlis asserts that the Ligurians passed into Germany.

this grave conclusion, but naturalists have denied the worst reports as far as regards prehistoric social relations.

It was in the age of copper that the invasion of Asiatics occurred—the men with round heads who occupied in Europe an immense wedge-shaped region, which can still be traced by the head-form of the inhabitants. The lower line of separation between the primitive dolichocephalic race and this new Asiatic people with round heads passes by the Alps and the Caucasus to the Himalayas. The upper line crosses Europe, and from Warsaw goes in a straight line to Bordeaux. Above and below this triangle the Europeans are still dolichocephalic, and within the triangle they are brachycephalic.

The invasion of the Barbarians in the middle ages brought about a similar movement of the nations towards the West, but the prehistoric invasions were probably less bloody, for there was no such barrier on the Danube as in the time of the Roman Empire. Behind the barrier formed by the Roman legions, the people pressed on, till they finally broke down the barriers and advanced into the Empire, fighting terrible battles on the way. The advance of the Barbarians in the neolithic age must have been easier, as the population then was less dense, and a stronger impetus must have been needed to burst through the confines of the Roman Empire, where Marcus Aurelius had fought victoriously till his death.

4. CRANIA OF THE MINOAN AGE IN CRETE

The want of national unity in Germany before the time of Arminius[1] was not the effect of the difference in the form of the skulls of his people; for the Germans described by Julius Cæsar and Tacitus were the same as the modern Germans. They who seek for the Aryan race in Germany must allow them to have been a people with as varied physical traits as the Europeans of to-day.

On the other hand, the anthropological researches which we

[1] P. Villari, *Le invasioni barbariche in Italia*, p. 24.

made in Crete show a pure race. Out of nineteen skulls which I examined belonging to the first Minoan epochs,[1] when the bronze age had scarcely begun, four only are brachycephalic. The measurements which I made agree with those made earlier by Dr. Duckworth,[2] and I hope soon to be able to publish the photographs and the detailed study of these nineteen skulls of the second Minoan epoch. The skulls from Erganos and Haghia Triada now in the Anthropological Museum of Rome, and published by Professor Sergi, are not all dolichocephalic ; one or two are brachycephalic. The figures of the cephalic indices of the copper age and of the beginning of the bronze age, show that the Asiatic race had not penetrated into Crete. Out of nineteen

[1] Crania of the Minoan Period in Crete

No.	Circumference.	Antero-posterior Diameter.	Transverse Diameter.	Cephalic Index.	Tomb.
1	53·0	19·0	14·4	75·8	Gournià, near Kumasa.
2	49·0	16·4	13·8	84·1	
3	50·0	16·6	13·6	89·9	
4	49·2	17·0	13·2	77·6	
5	49·8	17·4	13·6	78·2	
6	49·8	18·0	12·7	70·6	
7	52·0	18·8	13·7	72·9	Palaikastro.
8	49·8	18·4	13·0	70·7	
9	50·5	18·3	14·6	79·8	
10	48·5	17·0	12·9	75·9	
11	52·0	17·6	14·1	80·1	
12	—	17·6	12·6	71·2	
13	51·8	17·8	14·5	81·5	Knossos.
14	49·8	17·8	12·6	70·8	
15	52·5	19·0	13·3	70·0	
16	49·0	17·4	13·0	74·7	
17	53·3	18·9	14·6	72·2	
18	50·8	17·8	13·0	73·0	Arzà.
19	50·5	17·2	13·5	78·5	

[2] Dr. Duckworth measured 78 crania from Crete, belonging to the second period of the middle neolithic age (Middle Minoan II.), and found that 63·3 per cent. of the men and 70·6 per cent. of the women were dolichocephalic ; men 26·15, women 23·53, mesaticephalic ; men 8·55, women 5·87, brachycephalic (*Annual of the British School at Athens*, ix. p. 305).

skulls, four only are brachycephalic, but the maximum index of 84 cannot be attributed to a race other than the Mediterranean, because we find these somewhat rounder head-forms even in Egypt and Northern Africa.

The individuals of one animal species are never exactly alike, and it is by the accumulation of these variations that new species arise, and when any of these variations—for instance, of the head-form—are not favoured by natural selection, they oscillate round a centre without being able to leave it.

5. ANTHROPOLOGY AND THE DISCUSSIONS ON THE ORIGIN OF 'MINOAN' CIVILISATION

Dr. Dörpfeld, one of the chief authorities on archæology, who was Dr. Schliemann's companion in the excavation of Troy,[1] maintains that the most ancient palaces of Crete were built by the Carians and Lycians, who came from Asia Minor; and that the Achæans destroyed the first palaces and built the second. Dr. Arthur Evans and Dr. Mackenzie[2] are opposed to this theory. The question is of paramount importance, because Dr. Dörpfeld asserts that it was the Indo-Germans who brought the Northern civilisation from Caria into Crete.

I recognise with regret that anthropology is held in small consideration by the archæologists, but when there is no other way of settling a question they must deign to receive the help of anthropology. Now in anthropology we find proof that Asia Minor was not the starting-point of a migration towards Crete. Asia Minor is a country of brachycephals with an index varying from 82 to 85. No invasion can have reached Crete from this country, for, as we have seen, the Cretan skulls of the copper and early bronze ages are dolichocephalous.[3]

[1] W. Dörpfeld, "Die Kretischen Paläste," *Mitteilungen d. k. D. archäolog. Instituts*, Athens, 1907.

[2] Mackenzie, *Annual of the British School at Athens*, xi. 1904–5, p. 222.

[3] Ripley, *The Races of Europe*, p. 43. J. Gray, in his paper at the meeting of the British Association at Dublin, 1908, also holds that the population of Asia Minor is brachycephalous.

The riddle may possibly be solved when a bilingual inscription is found which will enable us to read the tablets which are now in the Museum of Candia. The relations of Crete with Egypt from the XIIth to the XVIIIth Dynasty were so close that we have every hope of soon finding a key to decipher the Minoan tablets—that mysterious library in which lies hidden a vital part of Mediterranean history.

The invasions of the barbarians were matters of such common knowledge that we cannot disregard the springs of history, as Vico calls them. And in prehistoric times also there must have been earlier invasions like that which crossed the Danube in the time of Claudius, when he defeated a host of 320,000 Goths. It was whole nations (pushed on, perhaps, by others in the rear) who were advancing towards the West of Europe. Many sociologists tell us now that the Slavs are the coming race, but such prophecies are a game of chance, and few pay attention to them. If the Slavs do succeed in getting the upper hand in Europe, it will not be because they have round heads ; they are the descendants of the last invading horde of Asiatics, and if the prophecy comes true it will be a struggle between the two races, just as it was in the old days of the neolithic age—but with this difference, that the primitive race has not become decadent but has grown stronger. The physical improvement of the Mediterranean race is evident, and the Latin stock, which is the stem of the first unification of European civilisation, is a robust plant whose roots are so deep in the ground and grow in surroundings so favourable to life that it has already blossomed three times—a unique example in history.

The Huns and the other savage hordes which came from the East across the path of the Germans have scarcely modified the physical characteristics of the populations whose territory they passed through and plundered, and still less marked is their influence on Germany when they advanced to the Rhine.

Herodotus [1] says that the Athenians were of Pelasgic origin and the Lacedæmonians Hellenic, and that the Pelasgians spoke

[1] *History*, i. 56.

a barbarous language. The Pelasgians were not strangers, for they dwelt in Crete : Homer calls them the "good Pelasgians," and it was they who passed over to the Continent and built the Mycenæan palaces. Anthropology teaches us that the ancient Greeks were dolichocephalous and belonged to the Mediterranean race. The Dorians, about whom there is so much discussion, also belonged to the Mediterranean race.

The preference of the Homeric singers for fair hair is no proof (though Lapouge thinks it is) that the Hellenes belonged to a race coming from the North. Their admiration for fair hair is caused by the greater rarity of this colour. The poets who sang the Homeric songs and the Sanscrit books of India attribute fair locks to the chaste ruler, and finally, among the black-haired Semites, appears the blonde and superhuman figure of Christ.

6. THE INDO-GERMANS HAD NO PART IN THE ORIGIN OF MEDITERRANEAN CIVILISATION

The fact that the population of the centres whence Mediterranean civilisation was diffused was purely dolichocephalic is a reason for denying any intervention of the Indo-Germans. I have already touched on this grave problem in the last chapter of my volume on Crete ; the study of primitive arms of copper and bronze having since taught me more of the routes followed by civilisation on the Continent, I am obliged to return to the subject. When an original Aryan language (or *Ursprache*, as the Germans would say) was recognised, it was admitted that there must have been a primitive people (*Urvolk*) who spoke it. As I am no glottologist, I cannot speak of the linguistic side of the question, but as regards the other sides, I must, as an archæologist and student of history, point out certain new facts which may be of use in the search after truth. The Indo-German theory comprehends four problems : 1. The existence of a proto-Aryan people. 2. Their language. 3. Their country of origin. 4. The time at which they lived. Of these four

subjects only one belongs to glottology. The researches on the most ancient arms of copper and bronze will help us with the three questions which the Germans call the *Urvolk*, *Urheimat*, and *Urzeit*.

Glottologists are agreed that copper was known to the Aryan people before they separated to spread civilisation over Europe. This is proved by the fact that the Latin word *æs* corresponds to the Gothic *aiz*, the Sanscrit *áyas*, Avestic *ayah*.[1] Professor De Michelis also writes in his recent book, "L'Origine degli Indo-Europei"[2]: "We cannot suppose that the complete formation of the Indo-European ethnic system was brought about before the bronze age was comparatively advanced"; and a little further on (p. 191) he adds: "While the proto-Aryans co-existed with the population of the neolithic age, these more or less direct descendants of theirs, whose Aryan tongue was imported into the terminal regions of the Indo-European territory, took part in a more advanced phase of civilisation in which bronze had already made its appearance, and in which, at least in certain parts of Italy and Greece, the early iron age had already begun or was about to begin."

The time of the separation of the Aryan peoples being thus fixed, it follows that European civilisation did not originate with the Indo-Germans, for the great Minoan civilisation, which was the mother of the Mycenæan and the Greek civilisations, must have arisen many thousand years before the separation of the Aryans, and a complete and perfect culture is found in Crete before the Indo-Germans could have occupied the countries where, according to the philologists, our civilisation originated.

When the early theory of the Asiatic origin of the Aryans could be no longer maintained, an attempt was made to locate the cradle of the race in Europe. The claim of Scandinavia to be the birthplace of the Aryans is disproved not only by anthropological evidence, but also by the date at which the use of copper began in Scandinavia. Sophus Müller has pointed out in his

[1] Schräder, *Reallexicon der Indogermanischen Altertumskunde*, Strassburg, 1901, p. 488.

[2] P. 187, Fratelli Bocca, 1903.

"Urgeschichte Europas" [1] that the age of metal did not begin in Scandinavia till the end of the first millennium B.C., while in Southern France and in England the age of metal dates back to the middle of the second millennium B.C.

We find in Denmark flint daggers copied from those of metal which, when of bronze, were used up to a late date in Italy; [2] and we have seen that civilisation was diffused from Italy towards the North, and not in the opposite direction. Scandinavia was not the cradle of the European nations, though even the Latins have been supposed to have come from thence: it was, in fact, so late in joining the ranks of the civilised world that, as Sophus Müller tells us, the arms and implements of metal that were already in use in Southern Italy were imitated in flint in Scandinavia during the latest stone age in that country.

At the present day it is generally admitted that the cradle of the Aryan race is in South Russia. This locality was fixed on, among other reasons, for this one—that it is a better geographical centre from which the Aryans could have entered Greece and Italy by expansion of their territory; but South Russia is still less adapted to be the cradle of civilisation so far as the history of metals is concerned. The difficulties which we noted in the case of Scandinavia are repeated in South Russia, and it may be said that bronze became known here, too, at a less early age. Traces of neolithic and enæolithic civilisation are scarce up to the present time both on the Steppe and in the Caucasus. This deficiency in the stratification of culture is alone sufficient to show that the impulse of our civilisation cannot have come from this region. And another all-important reason against the hypothesis is that no trace is found either in archæology or history indicating any passage of the Aryans towards India from either Central or Southern Europe.

If, however, we drop the idea of an actual migration of the people, and limit the action of the proto-Aryans to a simple infiltration, the difficulties are still insuperable, for there is no country or people in South Russia whence a civilisation or a

[1] P. 64. [2] Sophus Müller, *Urgeschichte Europas*, 1905, p. 63, Figs. 48, 49.

language so highly developed as that of the Aryans could have been diffused. The genealogical tree of the Indo-Germans is for naturalists and archæologists a fiction which has neither historic foundation nor a root in fact. The continuity, as it appears in the Island of Crete, from the neolithic age to that of copper and of bronze is so complete that we cannot admit the entrance of a foreign element from the North, or still less from Asia Minor —witness our study of the weapons of copper. If, however, a pre-Hellenic people had come from Macedonia into Greece, it could have added nothing vital to the Minoan civilisation, which had reached so high a degree of development before the migration and separation of the primitive Aryans. The degree of material and moral culture of the Minoan people was so high that there is no trace of any other people in Europe who either preceded or surpassed it before Homer.

To such an excess was the case for the Aryans carried that it was asserted that we are indebted to them for the domestication of animals, for the beginnings of agriculture, and for the discovery of copper and bronze. The belief that bronze was introduced by a people who burned their dead has, as we have seen, no foundation. In Crete, where the knowledge of metal-work was complete, the dead were buried till the latest Minoan times.

The Minoan civilisation is of essentially marine character, and so was Minoan religion. The discovery of the copper mines which had existed in Crete above a thousand years before the Homeric age enables us better to understand the economic conditions which sent forth the Minoan navigators by the shores of the Mediterranean to sell their weapons and objects of copper. This Minoan thalassocracy stands in crying opposition to the fact that the Aryans—according to Hehn—knew neither sea nor salt.

A comparison of the most ancient weapons and their names among various peoples shows a grave anomaly—that the names of the weapons have no common derivation in the Indo-Germanic languages. Dr. Hirt notes that there is no Indo-Germanic[1]

[1] Hirt, *Die Indogermanen*, i. p. 340.

word for club (*keule*), which was certainly one of the primitive weapons. The bow, the axe, and the quiver have no etymological connection in the Indo-Germanic dictionary.[1] In the case of the spear, dagger, and sword, too, there is no common derivation of the names,[2] and different terms have been adopted in the various Indo-Germanic countries. From these facts we must conclude that the Aryan people were unacquainted with arms, and philologists must solve the riddle. These examples must suffice to show how fallacious a method has been used in writing the history of the Indo-Germans.

[1] Hirt, *Die Indogermanen*, ii. p. 678.
[2] Schrader, *Reallexicon*, pp. 64, 786.

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